

kept their water (and wine) in amphorae, egg-shaped vessels that allowed the liquid to breathe. In many amphorae discovered in archaeological digs, grains have been found to be preserved so well after 2000 years that they germinated when planted, proving the effectiveness of the egg-shape for preservation.

12. SUPPLYING WATER

PART FOUR



The Life of Trees

13. The Role of the Forest

When someone dies the bell tolls. When the forest dies and with it a whole people, then no-one lifts a finger. Viktor Schauberger¹

Only people who love it should care for the forest. Those who view the forest merely as an object of speculation do it and all other living creatures great harm, for the forest is the cradle of water. If the forest dies, then the springs will dry up, the meadows will become barren and many countries will inevitably be seized by unrest of such a kind that it will bode ill for every one of us. Viktor Schauberger²

Viktor Schauberger, who believed that the highest quality water depends on the forest, predicted that deforestation would bring water shortage and climate change. As equatorial deforestation has greatly accelerated since he died, it might be useful to summarize the effects of this devastation.

Evolution of the forest

Plants have been around for 420 million years, which is only 9% of Earth's history. Without plants there could be no life, for plants are the essential link for converting the Sun's energy into food. Trees are the highest form of the plant, and the most efficient exchangers of energy between the Earth and the Sun. The forests are the main source of oxygen, an essential building block of life; they are the Earth's 'lungs.' There have been three periods when forests have flourished: in the Carboniferous Age 350 million years ago, when land vertebrates became established; in the Eocene, 60 million years ago, when primitive mammals first appeared, and in the last 500,000 years, when the cultures of modern man developed. It seems that in each case a boost in the oxygen content of the atmosphere, which the forests delivered, may have been the trigger for evolutionary explosion of Earth's life forms.

These extensive forests developed in the equatorial regions where the heat was available to prime a remarkable engine for moderating the extremes of temperature and the often chaotic nature of

the world's historical climate. In the first case they were evergreen forests, interspersed with enormous swamps. In the Eocene when the modern great mountain ranges were being uplifted, there were large tropical jungles, perhaps not too different from the modern ones which flourished on all the continents until the late nineteenth century, but with less complex fauna.

It is interesting to speculate what caused the forests to establish themselves at these periods. Viktor Schauberger recognized Nature as an intelligent system endowed with meaning and purpose that is concerned with evolving more complex life-forms and a higher level of consciousness. From that perspective it is possible that the establishment of forest might be seen as part of that purpose.

Forest cover varies with climate. Forests have been the natural cover of perhaps three quarters of the Earth's land surface during these periods of evolutionary expansion. This natural forest was an essential prerequisite for the development of the extraordinarily rich variety of fauna and flora (now called 'biodiversity') that makes this planet an important source of life in the Universe.

Destruction of the forests

Either fortuitously or by design, there seems to be a large degree of tolerance in Earth's ecosystems for the amount of forest cover required to support a balanced climate — though what a great reduction of forest does to biodiversity and the quality of life is another question. Over the half a million or so years of humankind's time on Earth, our species has been responsible for reduction of the forest cover to about 25% of its optimum extent. The early agriculturists would burn clearings to grow their crops, and then move on to allow the fertility to be replenished. Early civilizations, some well documented and some which are now folk memories, felled vast tracts of forest.

Many of these lands became desertified, such as the Gobi, Sind, Arabian, Mesopotamian, North African and Kalahari deserts — probably through a combination of deforestation and climate change. Whole nations were uprooted and had to move elsewhere in their search for subsistence. The same is likely to happen today where great swathes of the rich equatorial forests have been cleared. Fortunately in those days there was somewhere else for the displaced to go, because the world's population was still relatively

small. Today, however, because of overpopulation and an unsustainable birth rate, any climate changes that produce crop failures can mean only starvation and the loss of life through conflict. In temperate climates, clear felling of forests does not normally lead to desertification, but it affects the biodiversity, the fertility and therefore the long-term health of the environment.

Ten thousand years ago the whole Mediterranean region was covered with forests, mainly of oak. Then about 5,000 years ago the forests of Lebanon provided the timber for the Phoenician empire. We don't know what happened to the forests of North Africa, but two thousand years ago these lands were so fertile that the Romans called them the breadbasket of the Mediterranean. They are now arid desert. A thousand years ago 80% of Europe was forested; today it is about 20%, much of which is monocultured industrial woodland, which lacks the biodiversity and the energy of natural forest. In North America, the forest extended from the Atlantic to beyond the Mississippi, and of course west of the Rockies.

Sometimes the forests were exploited to provide fast economic expansion, regardless of the cost to future generations. In order to provide a navy capable of ruling the seas, in the early sixteenth century Henry VIII ordered the felling of a million mature oak trees, virtually denuding England of its mature oaks. The world's forest cover was reduced from about 75% at its greatest to about 50% in medieval times. By 1900 it had dropped to about 35%. In the frantic rush to get rich quick, regardless of the consequences, the figure has dropped to 25% and every year we are still losing equatorial forest the size of Belgium.

Today, the unstable social conditions worldwide, and irresponsible political leadership favour greedy opportunists anxious to make their fortunes, often illegally, by logging many of the finest stands of prime forests on every continent. This destruction is likely to be seen in the future as dangerous planetary vandalism, because their consequences will bear heavily on the future global environmental balance.

A moral tale

Easter Island, one of the most remote islands in the Pacific Ocean, was occupied by a people about whom we know little, but who had the most remarkable artistic skills (witness the giant statues they

left behind), and a sophisticated culture. It had a cover of forest, fertile soil, and at one time supported over 20,000 people. Towards the end of the thousand years of their occupation of the island, their society clearly deteriorated and they had felled all the trees, so that by AD500, there was no way to build a boat and leave the island. The people literally died out.

Of all the violations we have committed against the beautiful and fertile planet we call home, the destruction of the forests is the hardest to comprehend. The effects of such actions are so quickly apparent, in terms of soil depletion, or in extreme cases, of erosion of the living soil layer by rain or wind, and indeed, through climate change. The great floods of the Rhine in recent years, and the devastating floods in Bangladesh and the mud slides in Assam and Honduras have been caused demonstrably by deforestation in the mountains. In spite of this, the tree felling continues. When the European immigrants settled in North America, there was continuous forest from the Atlantic to the Mississippi.

Five thousand years earlier the great Midwestern prairies and the grasslands of Argentina were also forested. The deep soils of the temperate latitudes were created over hundreds of thousands of years by rich natural forest. (Grasslands do not produce deep soils.) And within a hundred years we have ruined these, first by intensive cultivation, and then by chemical poisoning. The American prairies, and the East Anglian wheat fields have lost on average half their soil depth. When in 1999, over 30,000 people died in mudslides in Venezuela, scientists blamed the weather! The obvious lessons are not being learned, which suggests that our 'experts' are completely out of touch with reality, a complaint frequently voiced by Viktor Schauberger!

We are told that the critical point may soon be reached when there will not be enough forest to produce sufficient oxygen to support high quality life. For the forests are the lungs of the Earth, breathing in carbon dioxide (CO₂) and exhaling oxygen (O). When the trees are felled, and again when they are burned, they contribute to the mass of carbon dioxide, the principal global warming gas. Recent analyses of fossilized amber have shown that their air bubbles contained 38% oxygen. Today the average oxygen content of air is 19%, which suggests that the human body was designed to operate at twice today's concentration of oxygen. In some larger cities the oxygen content has deteriorated to as low as 12%.

HIDDEN NATURE

Crucially, though still little understood, forests create the environment for the propagation of water, the 'first-born' of the energies of life, as Schauberger puts it, and they moderate the climate, making it cooler in summer and warmer in winter. They are also responsible for the mineralization and fertilization of the surface soils, essential for the nutrition of higher life forms and, most important of all, the forests create the rich humus and bacterial life, the foundation of a rich biodiversity, which stores and recycles vast amounts of rainfall, preventing floods on lower land.³

Tropical rainforests

Everyone who has the opportunity, before it is too late, should visit a tropical rainforest, for they are the priceless jewels of our ecosystem. Important not just for the incredible richness and variety of their fauna and flora, they have had a substantially modifying influence on the world's climate, helping to make most of the Earth pleasantly habitable and very productive. They were on four continents, but are now only about half their extent of 500 years ago: the South American is the most complete, at about 75% of its original size; the South-east Asian, from India, through Indo-China to Indonesia and Australia is about a third of what it was, and the African about 40% of its original size. The Central American has virtually disappeared.

More than twice as much of the Sun's energy reaches the Earth's surface at the tropics as in high latitudes where the Sun's angle above the horizon is very low. The tropical rainforests of the world act as heat pumps, transferring to higher latitudes some of the enormous energy they generate, thus evening out the temperature difference. Without them, the equatorial regions would be much hotter, and the higher latitudes much colder. The larger the mass of a tropical rainforest, the more effective it is as a heat pump.

Now that we know, from a study of the Amazonian rainforest, how the heat pump works, it is possible to conjecture that the African continent would not have been nearly as dry as it is today. In South-East Asia the destruction has reached cataclysmic proportions, with a free-for-all between corrupt local interests and greedy multinational companies who are also extracting minerals at a fast pace, particularly in Borneo, where most of the virgin forests, theoretically protected, are likely to disappear within fifteen years.

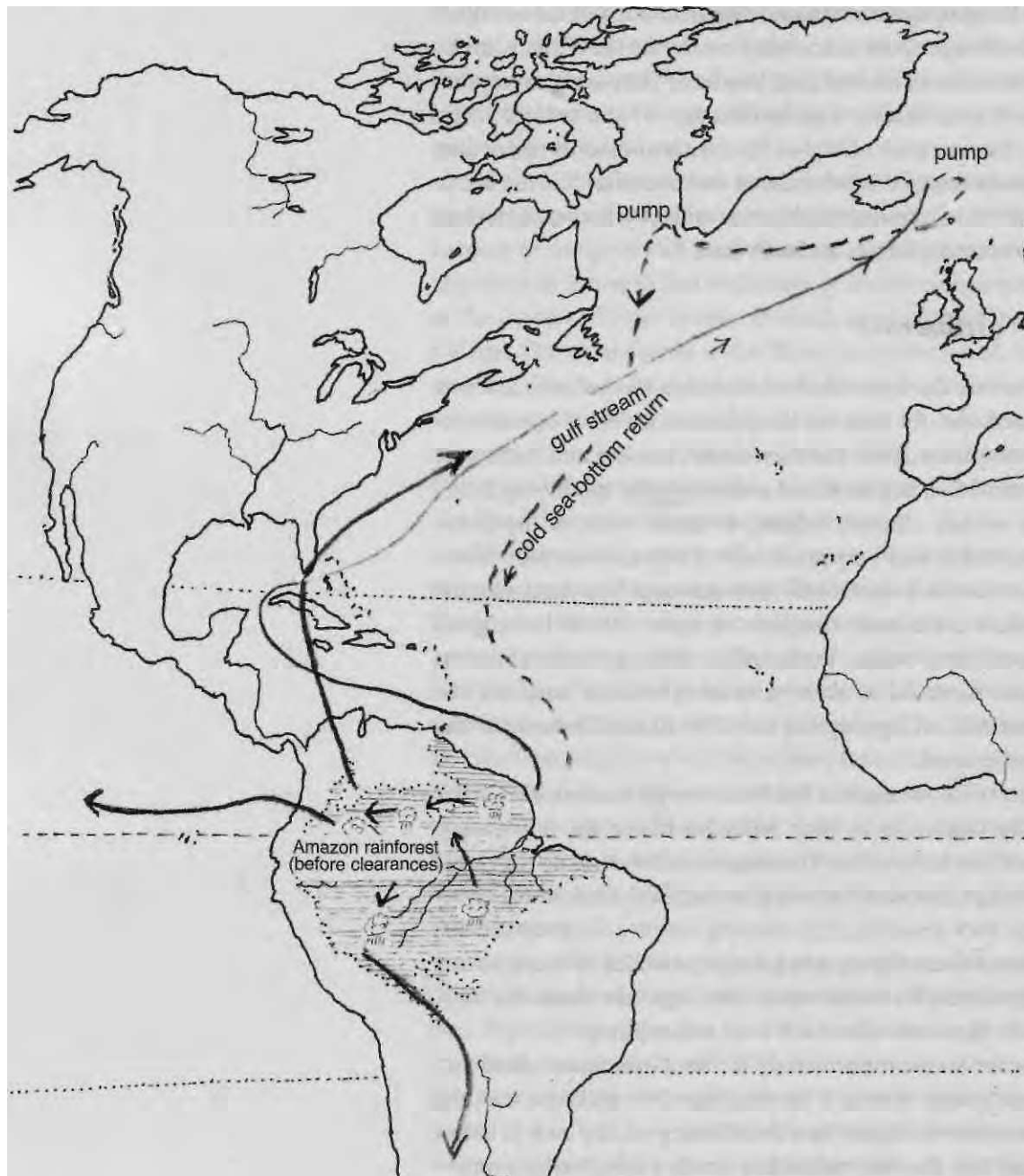


Fig. 13.1. The Amazon heat engine and the North Atlantic.

The Amazon Basin is the big heat engine that controls the climate of the Northern Hemisphere, but only when the tropical rainforest is largely complete. See Note 13.3 (p. 274) for how the Gulf Stream pump works, and the danger of its failure due to fresh water run-off from the Greenland icecap. Note 13.7 explains how the Amazonian heat engine works.

Within the last decade both droughts and storms have, for example in Australia, become consistently more severe. With the accelerated destruction of the forest, the climatic future of the region looks grim. Amazonia contains two-thirds of the world's surviving tropical rainforest, representing about 30% of all the biological material on the land.⁴ You can imagine that when all four tropical rain forests were intact, they must have contained the greater part of the plant and animal life on Earth.

The released energy drives the great air masses across the Amazon basin to the Andes, recycling the rain and evapo-transpiration several times in a leapfrogging process (see Fig. 13.1). The airflow then splits into three: the southern part is deflected as far as Patagonia; the central part flows over the Andes into the Pacific, continuing west as the trade winds; the northern airflow crosses the Caribbean, and helps to drive the Gulf Stream north-eastwards to Europe.⁶ Rainforests act as thermal engines, rainfall stimulators and as regulators of atmospheric and oceanic systems. They moderate the climate of the whole Earth and help to make it habitable.

The Amazon Basin, which comprises 7 million km² of rainforest, is the biggest and most efficient energy transformer on Earth⁷; it is self-maintaining when complete, but 25% has already been lost in the last 35 years. Five million km² lie in Brazil which has recently unveiled an accelerated development plan (see below) that would result in the loss of a further 20% by 2020 (a total loss of forest of 45%!). There is a critical size of the Amazonian rainforest below which this complex heat engine and rainfall distributor will fail. Some authorities claim that if it shrinks to much less than the present 75% of its original area, the forest will not be able to perform these critical functions effectively, resulting in more hostile weather patterns and drought across the globe.⁸

Areas that have been clear-felled put at risk the remaining forest for many miles from the edge of the deforested area, rendering the marginal area more susceptible to die-back due to the local increase in temperature. In fact, the Amazonian forest through deforestation is generally losing its ability to withstand the worldwide temperature increase created by global warming. At some point, perhaps in the next twenty years (or sooner under present Brazilian plan), a critical point could be reached, when massive die-back could cause this vital energy transformer to fail.

13. THE ROLE OF THE FOREST

Preservation of this precious forest is a tough battle. In June 2000, the biggest landowners in Brazil who control 50% of the agricultural land, pushed a draft law through the Brazilian senate committee which would have allowed a 25% increase in annual rates of clearing and burning of the forest. An international email campaign amongst environmentalists, instantly mounted, generated hundreds of thousands of signatures, forcing the Congress to back down. Less than a year later however, the Brazilian government launched the much more ambitious Avanca Brasil plan to develop most of Amazonia, with new highways, even railroads; new settlements and extraction of minerals and timber. The whole region will be transformed in the next twenty years, with the remains of the forest chopped into strips and blocks with little chance of survival. This unbelievably irresponsible policy can be stopped only by mass international protest.

Forestry

The death of the forests is only the tip of the iceberg and is a reflection of the deeper deterioration in humankind itself

Ernst Krebs

If a forest's climate changes over hundreds or thousands of years, the types of trees that grow in it will gradually change, without threatening the survival of the forest. However, if the rate of climate change accelerates, as it is doing today, certain species disappear before new species can take hold. The forest starts to lose its vitality and will gradually deteriorate into an arid wasteland.

The modern science of forestry began in the early nineteenth century. Napoleon in his passage over the Alps removed an unbelievable number of great trees, and the Swiss were determined to restore the damage. Less concerned with mass production than we are today, they insisted that planting must be of appropriate species. Though this sensitivity to landscape and the environment is still practised in Switzerland and Austria, in other countries forestry has deteriorated to the production of timber for cheap furniture, chipboard and firewood, as that is about all the poor quality of timber is good for.

Forestry today is about planting single species' woodland to be harvested within as short a time as possible (while the trees are mere adolescents) in order to maximize the profit. A redwood for

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example, which has a lifespan of 2000 years, today is harvested after sixty years, before it can be fruitful, at about 3% of its potential. Without mature seed, the genetic base of the remaining seed has deteriorated to the point of infertility. The consequences of this madness are far-reaching, for as the biological diversity is depleted of its highest quality organisms, so too are the energies that support higher forms of life. The destruction of the forest brings with it the destruction of water, with appalling consequences.

Monoculture

If you go into a typical plantation, it is impenetrable, dark, and feels dead — a veritable green desert. No birds sing nor animals scurry, and there is little opportunity for any other plants to grow. Those that do are removed on the theory that they take away nourishment from the trees. In fact their absence increases the competition. The individual trees are all of the same age and species; they vie with each other for space and for nutrients (of which there is a limited amount for each species), for their roots go down to the same level, creating a hard pan of salts which prevents access to the valuable minerals and energized groundwater below. There is only a certain amount of each element and chemical compound available which is suitable for that species and all the trees whose lives are wholly dependent on them must fight to get it.

It is hardly surprising that the wood from such a plantation is of very poor quality. You might compare the composition of a human community to a forest. If all the individual humans were clones of each other, and there were no elder statesmen or wise elders, how creatively barren and spiritually impoverished would be that community! These young trees are clear-felled, leaving a scene of devastation, with the valuable soil vulnerable to erosion. Students of forestry do not yet learn the purpose of a natural forest, nor about biodiversity, which is the keystone of Nature's order.

Without natural forest, higher forms of life on this planet would not have been able to develop. Apart from oxygenating the atmosphere and replenishing the water, both of which sustain life, it contains the vital pyramid of the different levels of life, without which creation would degenerate, as it is doing in our time. By a mysterious process, forests encourage rainfall; appropriate trees planted in

an arid or desert environment devoid of rainfall will often cause rain to fall, nourishing the trees, and starting the process of healing that environment.

Biodiversity

A natural, undisturbed forest has a rich diversity in colour and form that brings a sense of inner tranquillity and peace. With our warped sense of order we see the profusion of life as chaotic, whereas in fact it is in the highest state of order. Order in Nature arises from a sensitive state of balance in a highly complex ecosystem. What we often recognize as ordered is usually sterile and uniform.

The natural forest is a community of vast numbers of species of plants, animals and micro-organisms which cannot flourish or even survive without each other. This interdependence is something we still little understand, and the tragedy is that, with the disappearance of the tropical rainforests, we shall lose the vital laboratory that is the most complex ecosystem on Earth. They contain literally millions of species of fauna and flora, most of which we have not yet been able to study. Science does not yet fully understand either the full importance of biodiversity, nor how it is achieved, yet its preservation is essential to our salvation. There is a rapidly decreasing number of places in the world to study it, and they are hastily being converted to monoculture or to arable land, the exterminators of biodiversity.

The rainforest has many layers of trees and shrubs, the high trees, the overstorey, protecting those below that need shade. The trees with deep root systems bring up valuable minerals and nutrients from below, beyond the reach of the more shallow-rooted. The micro-organisms on the forest floor thrive on the rich variety of leaves and provide valuable nourishment for all the plants.

The ground remains cool and moist due to the protection of the trees overhead and the rich spongy humus can retain up to 85% of the rain, which recharges the water table and allows the full circulation of groundwater. This essential element of the natural forest is an early victim to deforestation for, when exposed to the elements, the ground surface quickly deteriorates, its ability to hold water compromised — for warm ground sheds the rain like concrete — which results in floods in the lands below.

The trees that grow the tallest, or on the outer edge of the forest

are equipped to withstand the heat and direct sunlight. They in turn protect those that are more delicate and light-sensitive, and the young trees that need the CO₂-rich environment and coolness of the lower layers of the forest.

Those trees and shrubs that are sensitive to light and heat are shielded from degenerative effects by varieties of tree whose structure is designed to resist the heating. By the time the mother tree dies, its young are ready to take over the role of their parents. Because trees are allowed to mature and live out their full cycle, their seeds are of the highest quality, which ensures that the forest stays in good heart. Nature here, with this rich variety, is in a productive state of balance, what Schauberger calls 'changeable, unstable equilibrium.'

Clearly only Nature, whose very foundation is interconnectedness, can truly create biodiversity, albeit slowly. Humanity, now the dominant species, if it is to survive, must replace its present methods of cultivation, for forestry or food, with radically different methods that are sustainable. The most promising experiments to this end have been made by Permaculture, an environmental movement founded by Bill Mollison and David Holmgren in Australia in 1974.⁹ They have demonstrated how to create an integrated environment of plants that grow best in association with one another, protecting each other from pests.

In these artificially created natural habitats, horticulture, forestry and animal husbandry are combined into a harmonious and sustainable whole. Shelter belts of trees are planted to protect the cultivated plots. The available water, the microclimate and the soil conditions are taken into account. Each human community is in this way able gradually to become more self-sufficient. Permaculture methods have been introduced, with great success, into countries like India where the levels of poverty often restrict the ability of people to feed themselves. Natural methods of composting and fertilization are used instead of artificial fertilizers.

High quality hardwoods are still coming out of equatorial and temperate forests and used for fine furniture and musical instruments. Soon these resources will be exhausted. Where else are we to find such fine wood? Since mass production has become the norm, understanding has been lost of the natural processes required to produce high-quality timber. Vast areas of land are cleared of trees

completely, exposing the soil to the direct heat and light of the Sun. This raises the ground temperatures, the delicate soil-capillaries are destroyed which deliver nutrients and moisture to the soil — and the groundwater table sinks. Hardwoods will not be used in the replanting, as they require too long to mature for commercial exploitation. Reforestation is generally of softwoods such as pine, for contemporary forestry is not interested in quality or in long-term investment.

Energy in the forest

The Sun's energy reaches the Earth's surface as a full spectrum of light waves. In a natural, mixed forest, this energy is transformed into creative growth, the various plants absorbing different parts of the spectrum. The outcome of this is the production of good water, a humus layer teeming with bacterial life (which is an efficient counter to pollution), and an overall coolness and feeling of harmony. In Nature, a function that maintains any system (e.g. a forest) in a state of stable health and balance is the outer expression of an inner creative force. It is significant that medicinal plants will grow only in a healthy forest where the biodiversity is greatest.

A monocultured woodland, on the other hand, absorbs only a part of the light spectrum, the balance being given off as ambient heat. The Sun's energy is provided to create balanced life forms. If it cannot fulfil its creative functions, it becomes destructive, in this case overheating the monocultured trees. The energies are not balanced, and this discord affects all the creatures. The pulsation and harmonious interaction of the energies are disrupted, encouraging disease and disharmony. Schauberger showed that highly ordered and diverse systems lose their stability when their environment suffers deterioration, indicating that we could expect moral and spiritual deterioration in the human community.

In the human body a blood temperature of 37°C (98.4°F) is regarded as being healthy. Should it rise to 38.5°C (103.1°F), symptoms of distress are felt and we become susceptible to infection by life-forms that are normally dormant in the body, but which become activated between, say 38.2°C (100.6°F) and 38.6°C (101°F). The body will usually respond with a fever, which drives the temperature higher, destroying the bacteria or virus that

brought the infection. Schauburger found that it is the same with trees. Their health is stable within a narrow range. When a tree becomes overheated, it becomes susceptible to parasites and fungal attack. It is not the parasites that cause the sickness, but the changes in temperature and energy balance.

14. The Life and Nature of Trees

Trees in the biosphere

Humans have always had a very close interdependence with trees.¹ Hominids came on the scene at one of those rarer times in Earth's history when a forest environment predominated. For the greater part of our short time on the planet, our ancestors grew up among trees. First they would slash and burn small clearings in the forest in order to grow crops. Wood was the greatest single resource to allow population to expand; it was the principal source of fuel and of building materials. These early societies were intimately connected with their environment; their shamans mediated with the life forces and the guardian spirits. The wildwood was treated with reverence.

Part of the forest was earmarked for growing sustainable wood supplies. Mostly this was for coppicing, when the branches are cut just above ground level every five to eight years. This practice produces an abundance of multipurpose straight branches and is eminently sustainable, encouraging re-growth.

The elders and the shamans selected special stands of trees for ritual purposes, for worship and for thanksgiving. These sacred groves were their churches and cathedrals, with altars, nave and cloisters. Later, many groups moved onto the savannahs, but societies like the Druids (dru means wood, wid, knowledge) in Roman times had complex tree classifications and tree medicines. The wildwood is a magical place, and it is not surprising that there is an immense richness of lore about the healing properties of different types of tree.

There is an area in Gloucestershire, in the heart of England, still known as the Wychwood that was one of the last stands of primitive forest to disappear to the demands of building a wooden navy for English control of the seas. To this day there remains in this area an awareness of the magical qualities of the wildwood, and a memory of the rituals of healing and of working with the nature spirits.

The tree is at the top of the botanical ladder, and is like a gateway between the human and plant kingdoms. The forest is a community

with a hierarchy among the trees. Each area has its wise trees or grandfather/grandmother trees. The older parent trees succour and nourish the young saplings.

Water is born from the fusion of molecular hydrogen and oxygen below the surface of the Earth, through the medium of subtle energies. The tree, with its roots deep in the ground, is intimately connected with the evolution of water. As we have seen, water takes the form of blood, lymph, sap and milk, the life-giving and maintaining fluids which are the basis for the growth and development of all life. Every living organism is therefore a column or container of water.

The form of a tree

All trees have a root system that absorbs nutrients from the soil and anchors the trunk; trunk and branches that define the shape of the tree and raise the crown to the sunlight; and leaves that perform the essential functions of photosynthesis, and making chlorophyll and carbohydrates.

The roots are the complement to the branches, securing the tree against wind and absorbing water that contains the energies and the minerals the tree needs to be healthy; they also play a vital part in the role of the tree as a biocondenser of energy. At the ends of the roots are magical organisms called protoplasms that convert the minerals from the inorganic to the organic state that the tree is able to use. There is a complex interaction between the roots and the bacteria, fungi and other micro-organisms in the soil, which is part of the energy exchange between the tree and the earth domain.

The trunk is formed for the most part from dead cells that give it rigidity and stability. The living parts are: the cambium that produces new cork or bark to offset what is shed on the outside; the phloem with fine capillaries that carry oxygen, nitrogen etc, down to the roots, and the xylem, whose coarser channels allow ionized minerals, salts, trace elements, carbonic acid or CO_2 to flow upwards. Phloem and xylem are also found in the structure of leaves, where they perform a similar function.

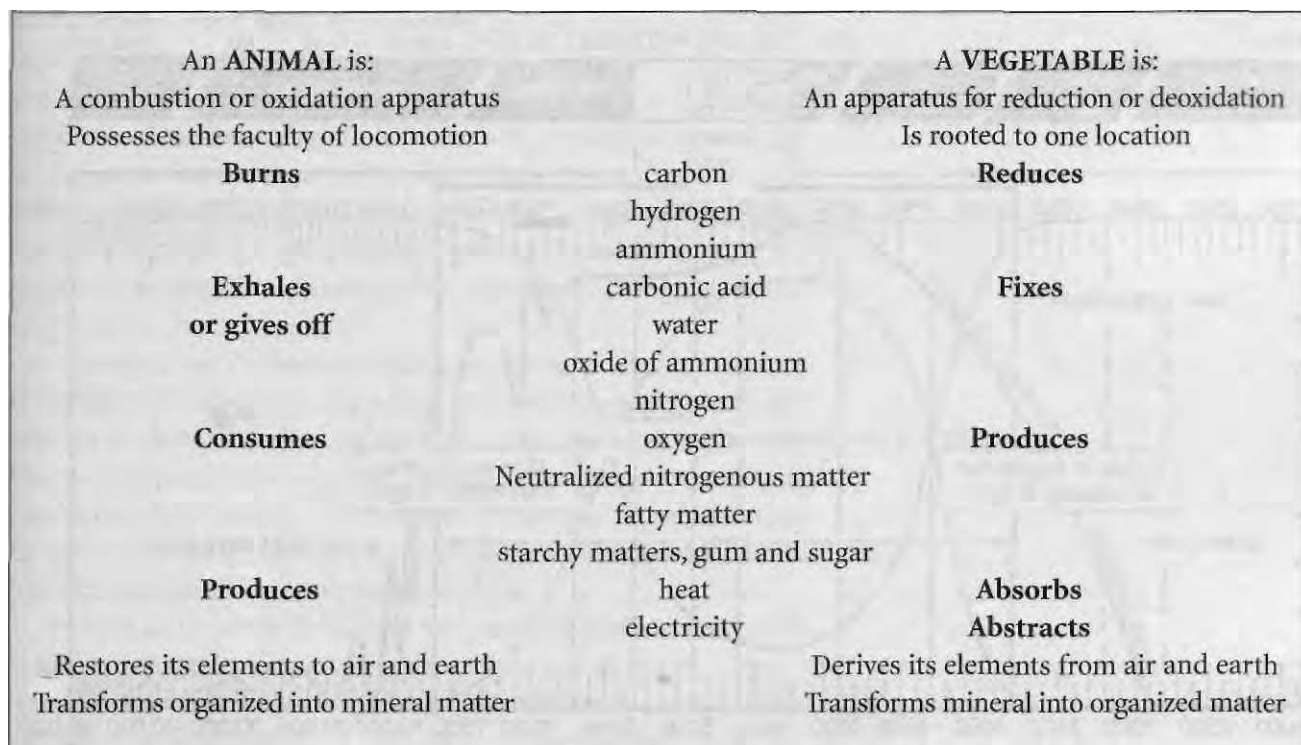
The crown is the most noticeable part of the tree, comprising branches, twigs, leaves, flowers and fruit or nuts. The leaves receive from the earth minerals and trace elements, CO_2 from the atmosphere and the Sun's energy to drive the process of photosynthesis;

the by-product of which is oxygen, vital for the sustenance of the animal kingdom and for other life-giving processes.

Trees and humans — a symbiotic relationship

The life history of a tree is also the life history of water. Trees are the highest form of plant life, as human beings are of animals. Humans and trees are marvellously interdependent (see Fig. 14.1). Trees, through the process of photosynthesis, exhale the oxygen we need for survival, and in return absorb the carbon dioxide we exhale. Of their total production of oxygen, 60% is released in daylight, the balance being used by the tree or plant itself during the night to produce cool oxidations that help to build the actual structure of the plant. As with so many of Nature's interdependencies, this is a symbiotic exchange, a cooperative transaction. Were there no trees and other vegetation there would be no animal, human or micro-organic life on this planet. Through our mindless deforestation, we have already reduced the amount of oxygen and water available to us.

Fig. 14.1 (below). The symbiotic relationship of animal and vegetable kingdoms.²

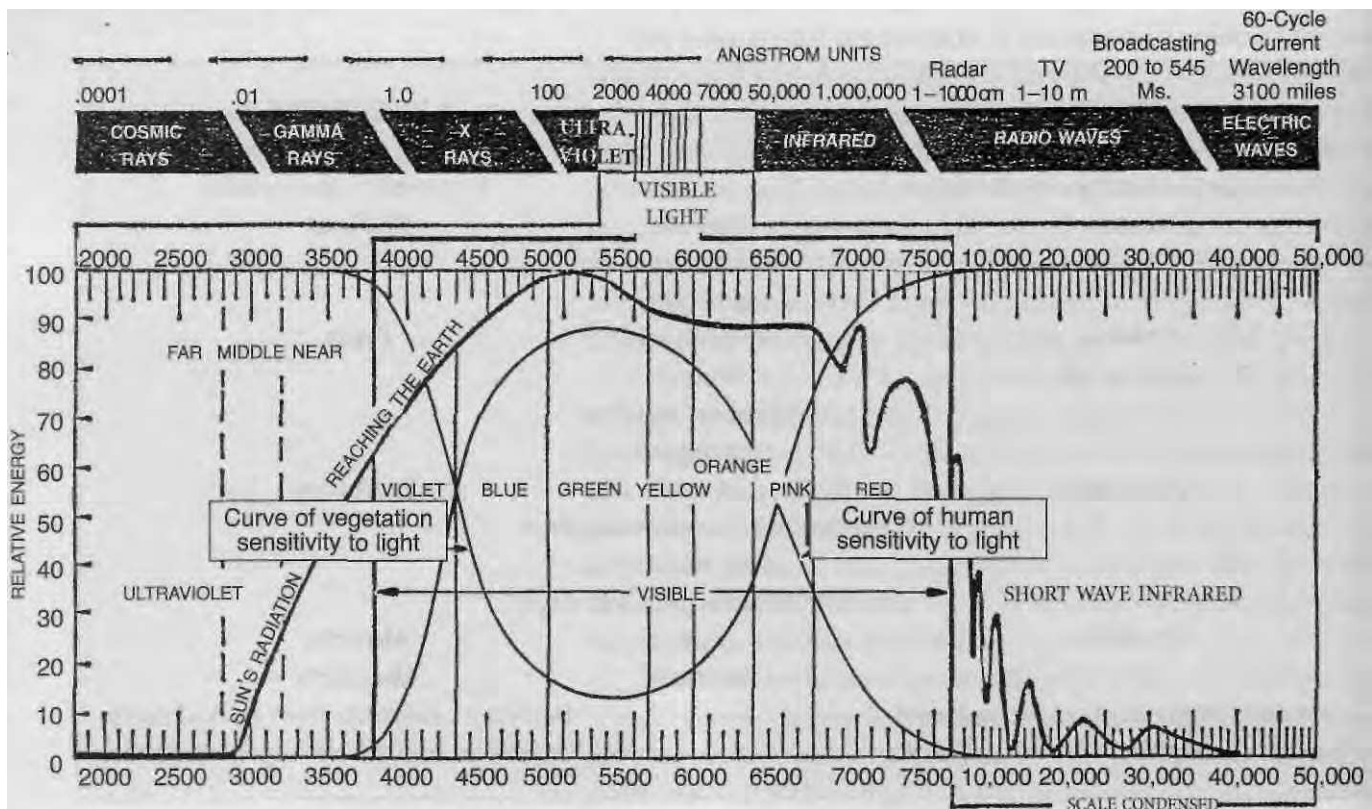


Trees and colour

Another symbiotic relationship between trees and human beings is found with colour. The graph below (Fig. 14.2) shows the relative intensities of radiation in the electromagnetic spectrum, from the ultraviolet on the left through the visual spectrum to the infrared on the right. The darkest line shows the intensity of solar radiation relative to frequency or to the various shades of colour. In the visible part of the spectrum there is high human sensitivity to the green and low to the red and ultraviolet, whereas with the tree it is the opposite. A tree's sensitivity to light is a mirror to the human's.

The highest intensity of solar radiation is found in the green part of the spectrum. The tree cannot use these frequencies for its growth, for the greens induce dormancy. Whatever colour or frequency is not absorbed, is reflected. A red surface, for example,

Fig. 14.2. The electromagnetic spectrum.



absorbs all colours except its particular shade of red. Many metabolic processes are triggered by specific frequencies, and if the required frequency of light is not available in sufficient quantity, then the response is blocked.

A tree will absorb most in the ultraviolet or the red to infrared portion of the spectrum. It is insensitive to green light and, if placed under green light, appears to be in a state of suspended animation. The light sensitivity of the human eye on the other hand is exactly the opposite. It is insensitive to the ultraviolet and infrared frequencies, but very sensitive to the colour green.

Because we cannot observe any green in sunlight itself, without trees and other vegetation, green would be missing in our experience. Green is a very soothing, healing colour for humans, sedating the nervous system and psyche. Its absence in large cities can make us irritable and even violent. Trees and humans have a symbiotic relationship with colour.

The physical nature of trees

The structure of the tree is a record of its various stages of growth, and this is mirrored in the movement of sap over the full span of the tree's existence. As the life energy of the tree recedes with ageing, the sap sinks lower and lower, progressively drawing back from the uppermost branches, which die off. In many cases this is accelerated by human activity and the tree is said to suffer from 'die-back.' Like an elderly human being, the tree's structure stiffens with age, and like an elderly human, its consciousness falls back through all the stages of its previous development, perhaps re-living its earlier experiences.

It is important in times of climate change to realize that the tree is probably the organism least adapted to rapid change. The average lifetime of a tree is the longest after rocks, and therefore many centuries must pass before any real adaptation to changed conditions can occur. Even minor environmental changes, to which other shorter-living things can adapt, can cause trees stress and vulnerability to disease, so that they wither and die.

As long as too much heat does not stress them, trees will moderate heat through their absorption of CO₂ and their evapo-transpiration. When the forest cover is substantial the trees distribute water vapour evenly through the atmosphere, ensuring a balanced

distribution of temperature. The evaporating area of a mature beech tree, for example, with some seven million leaves, totals about 1.47 hectares (3.6 acres).

Trees also break the strength of the wind, creating shelter for other life forms and lesser species of vegetation. The planting of shelter-belts (best in spiral form) reduces both the wind speed and the dehydration of the soil, creating microclimates that help the soil against erosion through the provision of additional humus and protection. Indeed shelter belts can influence the evaporation rate over cultivated land by as much as 30 metres upwind and 120 metres downwind, and Canadian research has shown that farms with a third of their land as shelter belts are more productive than farms of equivalent area where there are no trees at all.

These shelter belts also trap carbon dioxide (CO₂), the heaviest naturally occurring atmospheric gas, found mostly in the lowest levels of the atmosphere, and an essential component of photosynthesis. Increased CO₂ under the right conditions will produce stronger photosynthesis. When trees and hedgerows between fields are removed, productivity falls, because this causes a fall in carbon dioxide. Trees should be revered as much as water, for together they are both are the givers of life.

Tree classification

Trees can be classified generally into seven major categories. These can be subdivided according to latitude, altitude, whether they are light-demanding or shade-demanding species (the former having a thick, rough bark and the latter a smooth thin bark), and whether they are hardwood or softwood, broad-leafed, conifer, evergreen and so on.

Before we examine trees and their growth in relation to these categories in more detail, let us look at the specific contribution that trees make to the general environment. We give the example of a 100 year-old tree, whose extraordinary performance was calculated by Walter Schauburger in the 1970s in relation to the average output of European species:

During the course of its life, a hundred-year-old tree:

- a) Has processed and fixed the amount of carbon-dioxide contained in 18 million cubic metres of natural air in the form of about 2500 kg of pure carbon (C).
- b) Has photo-chemically converted 9,100 kg of CO₂ and 3,700 litres of H₂O.
- c) Has stored up circa 23 million kilogram-calories (a calorific value equivalent to 3,500 kg of hard pit coal).
- d) Has made available for the respiration of human and beast 6,600 kg of molecular oxygen (O₂).
- e) Against the forces of gravity, has drawn from its roots right up to its crown and evaporated into the atmosphere at least 2,500 tonnes of water, every tree is therefore a water-column and if such a column, which continually supplies and recharges the atmosphere with water, is cut down, then this amount of water is lost.
- f) Thereby fixing a mechanical equivalent of heat equal to the calorific value of 2,500 kg of coal.
- g) Has supplied a member of the consumer society with oxygen sufficient for 20 years, and its nature is such, that the larger it grows, the more oxygen it produces.

In view of such achievements, who in the future could value this tree merely for its timber?

The combustion of 100 litres of petrol consumes about 230 kg of oxygen. That is, after a trip of barely 30,000 km (18,640 miles) (9.6 lit/1000 km), this tree's entire 100 year production of oxygen has been squandered.

Driving an average size car 30,000 km (18,640 miles) = 100 years of oxygen production.

If a person chooses to breathe for three years, to burn 400 lit of petrol or heating oil, or 400 kg of coal, then the production through photosynthesis of 1 tonne of oxygen is required.

1 tonne of O₂ = the O₂ content of 3,620 m³ of air (+15°C at latm)

The photosynthetic production of 1 tonne of oxygen necessitates:

- a) The building up of 0.935 tonnes C₆H₁₂O₆ (carbohydrate),
- b) which process requires 1.37 tonnes CO₂ (carbon-dioxide) and 0.56 tonnes H₂O (water)
- c) The transpiration of 230 to 930 tonnes H₂O
- d) Light energy equal to 527×10^6 quanta ($\nu = 440 \times 10^{12}$) which represents 3.52 million kilocalories.

All this is no small achievement for a single organism!

[Source: Walter Schauburger]

Light- and shade-demanding trees

There are two types of tree with very different requirements of light (see Fig. 14.3). The effect of light on tree growth has two principal energy outcomes. Partly it determines the structure of the timber and, secondly, it influences the form and character of the tree itself, depending on whether it is a shade-demanding or a light-demanding species; and these are also related to latitude and altitude.

Trees mirror the quality of light in their natural habitat. If the frequency of green is harmful to them, they will use green leaves as they will screen out or repel that frequency. In general, if the incident light has a greater proportion of high-frequency, high-energy, ultraviolet light, in other words hard light, the wood will be soft. Conversely, where there is a greater preponderance of low-frequency, low-energy, infrared, soft light, the wood will be hard.⁴

Australia's native timbers, notable for their hardness, are a good example of this. Because of Australia's position on the Tropic of Capricorn in the southern hemisphere, the intensity of infrared light is greatest when Australia experiences its high summer, and when the Earth is also at its closest to the Sun at Perihelion in early January. This is increased by the infrared radiation resulting from Australia's semi-desert condition. Along with other countries in the southern hemisphere, Australia is therefore exposed to more intense infrared light than countries in the north which experience more moderate conditions.

The new growth of many species of Australian trees presents a particular mixture of red, violet and blue hues, in order to resist the potentially harmful penetration of those light frequencies. In Europe and the temperate latitudes of North America, on the other hand, with their very different light conditions, most new growth is light green in colour, with some exceptions (like the copper beech).

To summarize: Softwood species, such as pine, are mostly found in zones of high-energy, high-frequency 'hard' radiation, at low altitudes in high latitudes, and at high altitudes in low latitudes. Conversely hardwood trees, with some exceptions, are generally found at low altitudes in low latitudes (tropical rainforests) and at low to middle altitudes at low to middle latitudes — zones of low frequency, 'soft' radiation.

Tree types are determined to a great extent by: latitude and altitude.

- (1) LIGHT-DEMANDING timbers — THICK, generally rough bark (e.g. oak, black walnut)
- (2) SHADE-DEMANDING timbers — THIN, generally smooth bark (e.g. beech, birch)
- (3) HARDWOODS — thick (e.g. oak, jarrah) and thin bark (e.g. walnut, cherry, maple, red alder)
- (4) SOFTWOODS — thick (e.g. redwood, pine, spruce) and thin bark e.g. (hemlock, fir, larch)

GENERAL		DISTRIBUTION*
(5) CONIFEROUS	(6) DECIDUOUS	(7) RAINFOREST
(evergreen)	(intermittent)	(evergreen)
(polar latitudes)	(median latitudes)	(equatorial latitudes)
(high altitudes)	(median altitudes)	(low altitudes)

*These boundaries are not necessarily clearly defined.

High altitude trees such as spruce have a relatively short lifespan. Shortwave ultraviolet light, with its higher energy and intensity, has a faster dynamic motion with a smaller radius and shorter period tend to favour evergreens with soft wood. In contrast, low latitude or low altitude trees like the beech, where long wavelength, low-energy, low-frequency, less intense light predominates, has harder wood and a longer lifespan.

Contemporary forestry practice requires trees to grow rapidly in girth, putting on a profusion of branches. What this produces is a great quantity of poor quality timber, full of knots. The disregard by forestry of the light factor is one of the causes of the deterioration of forests.

The increase of tree diseases in both logged natural forests and in plantations is a direct result of the exposure to direct sunlight and heat of a shade-demanding species. There are two ways to determine whether a tree is a light- or a shade-demander:

Shade-demanding species have thin smooth bark; growing normally in the cooler inner forest, they do not need to insulate themselves from the heating effect of direct sunlight. Light-demanding trees on the other hand have thick, coarse, thermally insulating bark, which is Nature's way of protecting them from heat and direct sunlight.

Fig. 14.3. Tree type distribution.

Shade-demanding trees grow additional branches to protect the trunk when exposed to light and heat, whereas light-demanders do not. The shade-demanding tree is rather like an introvert, reserved and extremely sensitive to external influences. They tend towards introspection, mental activity (predominant development of the tree's crown) and they are inwardly preoccupied and absorbed. They need a certain shielding and protection, peace and quiet to develop to maturity and their full potential.

The light-demanding trees on the other hand are the extroverts that can happily stand on their own, reflecting their need for light and space around them. They tend to be more physically active, with branches radiating outwards. They are independent, outgoing individuals, which are generally more capable of standing on their own feet without support.

Viktor Schauberger showed that the maintenance of an even inner temperature is vital to all trees, as to all organisms. When sunlight penetrates the trunk, the tree's metabolism is disrupted. It becomes overheated, the sap no longer flows as it should and the general structure of the tree becomes very coarse, leading to malformations, cancerous growths in the interior, and so on. All shade-demanding trees, and under certain circumstances light-demanders too, will do everything they can to maintain or reinstate their preferred inner temperature.

This can be seen after a forest fire, when the trees that survive quickly cover themselves with a profusion of small shoots. The fire has blackened their bark so that, instead of reflecting the heat, it absorbs it and other radiation. Without protective cover the interior of the tree would quickly overheat and the flow of sap would reduce, no longer reaching the highest branches.

Every species of tree has its particular pattern of energy frequencies, which determines its shape and supporting metabolism. If you like, Nature has given it a special niche in a particular environment. An increase in temperature changes its microclimate and the plant's naturally established metabolism can no longer operate healthily, and its wave pattern is disturbed. Instead of 'healthy tree,' there is 'sick tree + parasites.' It is important to understand that the parasites do not cause the sickness, but come as a result of it. Viktor Schauberger called them 'Nature's health police' because of their role in removing all organisms that are not evolutionarily viable. The tree will rid itself of parasites once its metabolism has returned to healthy balance.

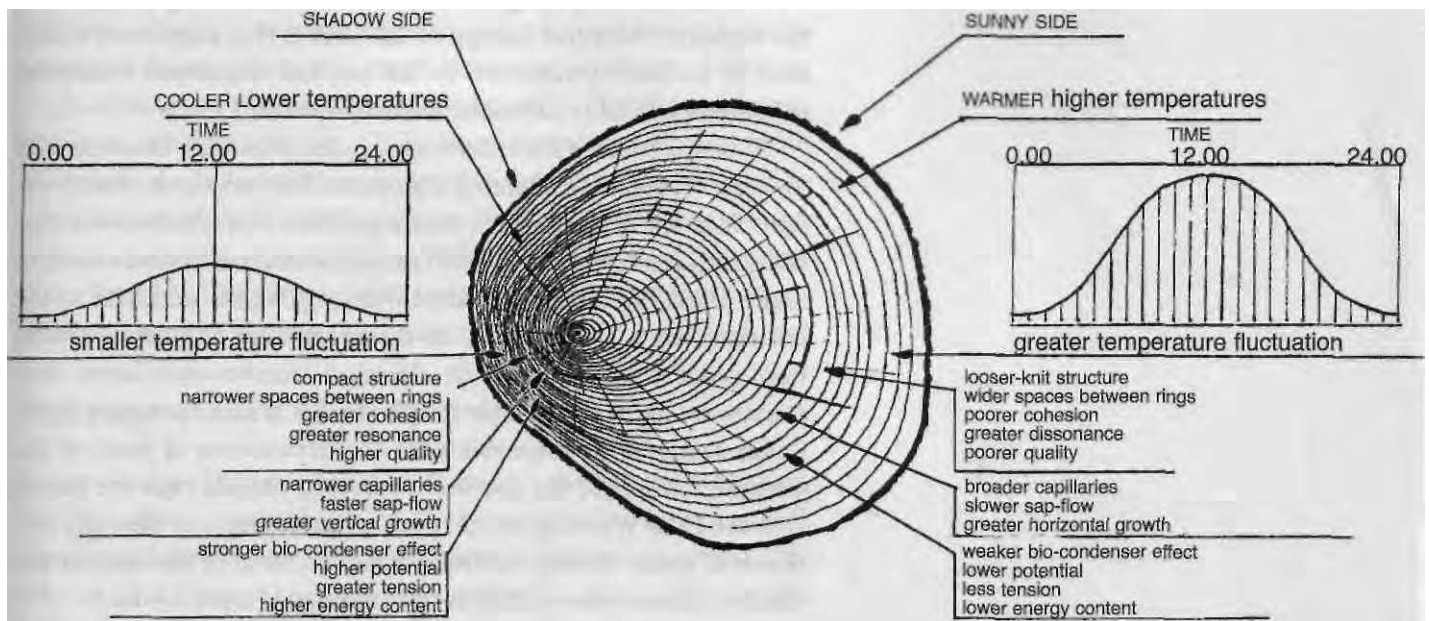


Fig. 14.4. Tree rings showing unbalanced growth.

Light-induced growth

You can tell the age of a tree by counting the growth rings across the cut trunk. These annual rings also tell you something about the conditions under which it grew, and about the climatic variations. Conventionally, a wider space between rings is regarded as a good year for the tree, because it put on more growth; but greater quantity does not mean better quality. What it actually signifies is a tree under heat stress. This is best seen in Fig. 14.4; where the rings are widely spaced on the sunny side of the trunk, the heat caused the wood to expand; on the shaded side the metabolism has not been disturbed and the annual rings are close together.

In a tree that grows in the shade with good soil conditions, the sap-ducts are virtually straight, producing strong vertical growth, and the timber has what might be termed a 'resonant' quality.⁵

Man-made depredations

Viktor measured the biomagnetic energies in a tree that are responsible not only for its physical upward growth, but also for transferring energies from the Earth to the atmosphere. The tree is in fact a

biocondenser, reconciling the Sun's positive, affirming energy with the negative, receptive energy of the Earth. This important role is seen at its most productive in the tropical rainforest, where the enormous fecundity of Nature is best observed.

Biomagnetism, a life enhancing process that puts bioelectricity to work, is present in all living organisms. Man-made electrical systems interfere with Nature's biomagnetism. The shortwave emissions (microwaves) of the world's communication systems have, in many places, seriously interfered with organic life on Earth in the last sixty years. This is seen with the appearance of human cancers near radar establishments or electrical transmission lines, with microwave ovens or portable telephones.⁶ It is also damaging trees. Radar seems to be responsible for the destruction of parts of the German forest, and the sub-arctic forest in Canada near the line of Defence Early Warning installations.⁷ Viktor observed the early evidence of radar damage to trees; however, most of the destructive effects of microwave pollution have developed since he died.

Microwave transmitters operate with wavelengths between 2cm and 50cm, exposure to which can inflict biological damage. Microwaves have an energetically disruptive effect, triggering deteriorating changes in crystal structure. An example of the amount of free ambient energy being generated can be seen from the use of a neon-filled tube to test the system's working. Held parallel to the direction of transmission from a microwave transmitter, or a high-tension powerline, its spontaneous ignition confirms the ambient energy's strength.⁸

Similar disintegrative effects are found with domestic microwave ovens that operate on a wavelength approximately the same as that of radar. They generate vibrational heat in the molecules of the food.⁹ Hydrogen, one of the constituent atoms of the water molecule, has a wavelength of 21cm, well within the bandwidth of current microwave transmissions. It is therefore likely to be damaged by the excessive microwave-induced heating. In the tree this leads to the breakdown of the structure of the sap, which like our blood, is about 80% water. This process also increases the amount of available oxygen within the tree, which results in unnatural metabolic acceleration. The tree, being rooted to the spot, unfortunately cannot escape the radiation emitted by microwave towers and high-tension transmission grids.

Even though we are more mobile, humans too can become

increasingly prone to blood disorders if exposed excessively to such radiation. People living in close proximity to high-tension cables have been shown to have a higher than normal incidence of disease. According to a study of the Commonwealth Scientific and Industrial Research Organization (CSIRO), an increase in tree ring width of Huon pines in Australia, more rapid in the last forty years than in any other period since AD 900, suggests that this internal microwave-induced warming is accelerating. We don't know what happened then; there may have been either a series of gigantic volcanic eruptions or a massive increase in cosmic radiation.

The importance of photosynthesis

Nature works through pulsation, through inhaling and exhaling, like the ocean tides on the shore. The rising Sun draws up the tree's sap charged with trace-elements, gases and minerals, to support the process of photosynthesis and its conversion of CO_2 into oxygen (the inbreath). Photosynthesis, however, is intimately connected with the amount and the quality of the available light. When the level of light falls, then growth, photosynthesis and the creation of chlorophyll diminish and less oxygen is transformed and released into the atmosphere. Then the tide starts to ebb, and the sap ceases to transport the nutrients upwards.

We think of photosynthesis as the process of converting CO_2 to O_2 for us to breathe, but it serves two functions vital for the tree itself: to convert the nutritious sap into carbohydrates (which releases O_2) and to produce evaporation in the form of oxygen and water to cool the tree and release oxygen into the environment. This is not the vaporization associated with sweating, but is the effect of energy concentration or densification. Magnesium is required, in addition to H_2O and CO_2 , in order to make chlorophyll, the green protective pigment in the leaves, a third process which releases O_2 . These three processes all require light (see Fig. 15.6).

Exactly the same chemical formula that is required to produce chlorophyll, but without light (i.e. underground) also produces hydrogen (and magnesium carbonate). This free hydrogen is an essential ingredient for the production of water, the other being oxygen, which is provided by rainwater percolating into the ground. It is exciting to note that these two identical combinations of Mg , H_2O and CO_2 , one with and the other without light,

are responsible for the two creators of life, water and photosynthesis (see Fig. 15.6).¹⁰

We have noted a correspondence between times in the past when forests predominated on the Earth, and with major evolutionary surges. It seems that trees have this magical role to fine-tune the proportion of atmospheric gases, particularly oxygen. The 'normal' proportions are O₂ (oxygen) 20.95%, CO₂ (carbon dioxide) 0.3%, N (nitrogen) 78.08% and rare gases 0.93%, though recent years have seen an increase in CO₂ and a decrease in O₂ due to human activities. When we say that life creates the atmosphere (effectively the 'greenhouse'), the symbiotic relationship is exceedingly complex and miraculous.

Fig. 14.5. Photosynthesis.

PHOTOSYNTHESIS

Without plants there could be no life. Plants convert sunlight into food by a process known as photosynthesis. They extract carbon dioxide from the atmosphere, water from the soil and exhale oxygen:

- 1) Carbon dioxide (CO₂) + Water (H₂O) = Photosynthesis + O₂ ↑
in this way carbon dioxide and hydrogen combine and molecular oxygen is released (vertical arrow)
- 2) CO₂ + H₂O + LIGHT → CH₂O (theoretical carbohydrate) + O₂ ↑
(C₆H₁₂O₆ = glucose, the simplest form of carbohydrate)
- 3) Mg + H₂O + CO₂ + plus LIGHT → Chlorophyll + O₂ ↑
(green pigment + molecular oxygen)

The same elements in (3) above produce two important further reactions:

- (4) Mg + H₂O + CO₂ - minus LIGHT → MgCO₃ + H₂ ↑
(magnesium carbonate + molecular hydrogen)
- or (5) Mg + H₂CO₃ [carbonic acid] - minus LIGHT → MgCO₃ + H₂ ↑
(magnesium carbonate + molecular hydrogen)

In (4) and (5) the Mg can be replaced with calcium (Ca), which produces calcium carbonate (CaCO₃) instead of magnesium carbonate, but with the same release of molecular hydrogen.

These two almost identical, but still different combinations of magnesium, CO₂ and H₂O are the prerequisites for the two principal carriers of life, namely water and photosynthesis (creation of chlorophyll and carbohydrates). One of these takes place in daylight (the visible world) and the other in darkness (the invisible world). In the day zone, O₂ is released and the overall amount of oxygen increased, whereas in the night-zone, hydrogen is released, leading to the rebirth of water through its combination with oxygen.

The creation of water

There is an important relationship between rainwater and trees. Raindrops absorb atmospheric oxygen, nitrogen and other trace-gases in their descent, but their downward spinning movement also generates intense bioelectric and biomagnetic fields. This creates an energy potential which is essentially life-endowing. When the raindrops fall on the leaves of the tree, the oxygen and other gases are absorbed along with the immaterial energies collected, stimulating activity and growth. For this reason plants respond with much greater vitality and activity after a fall of rain than to conventional systems of irrigation where these gases and energies are virtually absent, due to the far shorter fall distance.

It has frequently been observed that the planting of trees in arid or desert conditions causes an increase in rainfall. This is probably because chemicals that are a by-product of photosynthesis are emitted, which helps to generate clouds.¹¹ This is known to occur in the tropical rainforests, and it is likely to happen in other particularly warm areas. It is one of the most interesting feedback mechanisms that Gaia produces.

When the ground surface is cooler than the air (i.e. it has a positive temperature gradient) rainwater penetrates into the soil. The free oxygen is gradually absorbed by the surrounding soil, activating micro-organisms in the humus upper layers of the soil. As the rainwater sinks deeper into the substrata and continues to release the excess oxygen, it gradually cools towards the +4°C anomaly point. As we have seen, free hydrogen is now available with which the now very passive oxygen is able to combine in the cool conditions, giving birth to new water molecules.

This juvenile immature water, unpolluted by any other substances or ingredients, is born near the temperature when its density is highest, that is, about +4°C (39°F). It begins to rise up through the various energy-horizons (the most finely differentiated temperature strata), acquiring increasing 'information' in the form of subtle energies and resonances.

The water molecules become warmer as they ascend, absorbing salts, minerals and trace-elements on the journey. Becoming ionized in the process they can be taken up by the plants and their micro-organisms. Salt (sodium chloride), for example, is broken up

into its two components of chlorine (Cl) and sodium (Na), which develop opposite electrical charges when ionized. It is transformed from an 'inorganic' substance with no electric charge, into two substances which can be combined into organic form ready for combination with its complementary polarity.

The water has now become mature and can contribute life instead of seizing it, creating life-imparting macro water molecules whose nutrients are made more active by the increasingly available oxygen. As these molecules are drawn up through the capillaries of the plants or trees, their size is reduced, as energy and nutrients are passed to structures and chemical processes at different levels, contributing to growth activity. Their potency increases as the molecules become smaller until they are able to pass through the extremely minute foramen and stomata, when their energetic quality reaches a maximum. The greatest growth and maturation occurs at this workplace, the furthest extremities of the tree, plant or blade of grass.

The maturation of water

The developmental journey from the deeper strata towards the surface transforms water from a seeking, 'taking' system into a ripe, information-rich 'giving' one, when it is ready to distribute the widest variety of ionized elements in homeopathic doses to the living systems of its environment. It is here that this alive water, rich with minerals and trace-elements, meets the next, young, 'taking,' information-seeking systems — the fine hair-roots of the plant systems and their micro-organisms, or 'microtransmuters.' The water is first taken up by the micro-organisms which transform the raw materials, elements, CO₂, oxygen, nitrogen, etc. into larger molecules and fluid compounds ready for transport as larger molecules by the capillaries of the roots.

The roots eagerly use some of these nutrients for their own development, but the coarse macro-molecules are sucked towards the centre and deposited in order to build up the central structure of the plant or tree. This increasing, but slower flowing quantity of formative material is built into the tree structure up to the level of the ground-surface. Here is the threshold of the visible, energetic world, endowed with a higher dynamic and suffused with radiant, fertilizing energy of the Sun. This is the point where the two aspects

of the tree, the two systems of distribution, the seen and the unseen, meet and are united (see Fig. 15.6, p. 206).

In the human body, the arteries and veins narrow towards the capillaries and enlarge towards the heart. The blood circulation is managed by subtle differences in temperature and electric charge, by energy density and energetic activity. There are two principal, pulsating circulation systems; one to the lungs to renew oxygen and discharge CO₂ and water; the other from the heart to the rest of the body, delivering nutrients and oxygen to all parts of the body, on its return collecting and transporting CO₂ and waste matter.

The tree, however, has no pulsating heart. The 'pulsators' responsible for the movement of its sap are the Sun and the Moon. As the world rotates, the direction of the Sun's and the Moon's attraction fluctuates from above to below, through which a pulsation arises between inhaling and exhaling. During the day, the sap draws the energies up the tree ('inhaling'), while at night the energy withdraws to the root system (exhaling).

As the sap rises from the ground level, gradually the sap-ducts and capillaries begin to narrow and the coarser elements in the sap, unable to rise further, are built into the tree's structure at the point where their upward movement ceases. As the sap vessels get smaller, the faster the sap streams both upwards and downwards and the greater the homeopathic potential. Ultimately only the most minute particles, which are hardly to be counted as matter, stream up towards the crown or down to the roots with increasing spiral gyration, dynamic and energetic effect.

The growth activity is at a maximum at the extremities of crown and root zones, because all that is active here are the most highly potentiated homeopathic resonances and amounts of barely structured matter. This upward or downward stream of energy also has a nonmaterial, form-controlling aspect. At the outside edge of the growth process, the tree crown, energy radiates into the environment, a process of life giving life, while at the root zone the energetic polarity seems to be that of life seeking life.

A water molecule, when it reaches the crown, carries within it the highly active resonances of the trace elements previously taken up in the root zone. Refined to almost pure water again, with ultra-high potency and trace element overtone resonances, it arrives at the leaves' minute stomata. From these, it ascends into the atmosphere towards its energy and temperature anomaly

point at an altitude of 3-4000 metres. Here it is once more in a 'taking' mode, ready to take up the finer and more spiritual energies from the Sun and the cosmos.

This never ending water cycle over time brings a cumulative increase in 'information' which provides a fresh impulse for further processes and development that drive evolution.

15. The Metabolism of the Tree

All the processes that take place in water are reflected once again in the individual forms of vegetation. Viktor Schauberger

Sap movement

Viktor Schauberger has transformed our understanding of the metabolism of the tree. He showed how the movement of the sap under the conditions of both natural growth and of unnatural light-induced growth is determined by the temperature gradient within the tree itself, and by the external light, heat and cold.

The solution, transport and deposition of nutrients, as we saw in Chapter 14, are functions of the temperature gradient. Salts and minerals are precipitated with cooling, when light and air are excluded; however, they are precipitated with heating when exposed to light and air. Under a positive temperature gradient, as the sap cools towards +4°C (39°F) or is maintained at this temperature, the highest quality nutrients are precipitated last. Under a strong negative temperature gradient and with light and heat, the opposite happens; only the lowest quality nutrients are expelled, the highest quality not being transported at all.

We saw that the growth of shade-demanding trees takes place largely in the crown where the air temperature is usually higher than at ground level. The tree's overall shape is cylindrical, with few lower branches, because there is no need to protect the trunk against light. Lacking horizontal lighting, the trunk does not suffer large temperature fluctuations, so it produces closely set annual rings. The temperature in the trunk reduces from the outside inwards, resulting in an even deposition of growth material, which means high quality and dense timber. These shade-demanders have a slender girth because of their strong vertical sap movement, high health and associated levitational energies, that in a mature tree enables it to withstand gales.

When a shade-demander is planted out in the open it has to cope with unnatural levels of light and heat, protecting itself as quickly as possible by sending out branches right down to the ground, at the

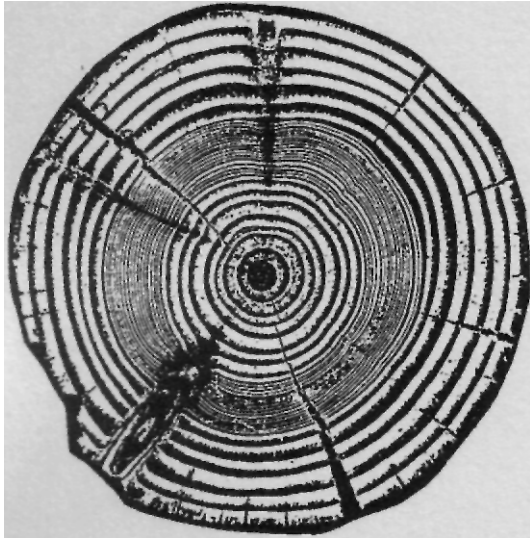


Fig. 15.1. Cross section through tree trunk.
The tight inner rings show normal growth of a shade-demanding tree. The outer rings show evidence of too much exposure to sunlight, following its neighbours' removal.

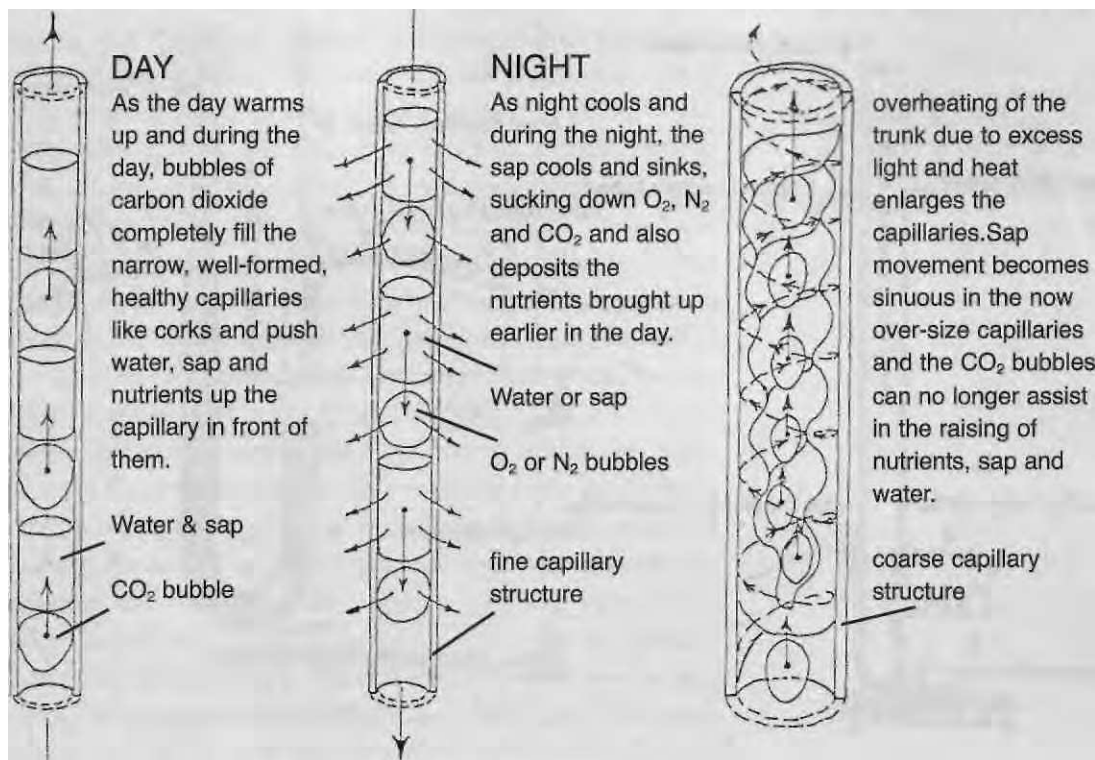
expense of its upward growth. It develops a cone-shaped form, with much growth of branches on the lower part of the trunk. These will tend to grow on the sunny side of the tree, leaving it unbalanced and misshapen.

In its early years, due to high light exposure, a plantation tree exhibits wide annual rings and abnormal lateral branch growth (see Fig. 15.1). Once it receives some protection from its neighbours, the need for lateral branch growth diminishes and it will tend to grow upwards. However, in commercial woodland, the trees are thinned after a prescribed period, those considered suitable for use in construction going to the sawmill and the remainder to the pulp-mill. This thinning out exposes the remaining trees to excess heat and light. All their growth energy is diverted to growing branches on the exposed part of the trunk, mainly on the sunny side, which produces knots and twisted, spongy grain.

The annual tree rings tell the story of a tree's exposure to light. In Fig. 15.1, the rings near the middle show that in its early years, this 33-year old tree was exposed to unnatural levels of light and heat. The healthiest growth was in middle third of the tree's life, revealed by the annual rings at their closest. Its last years show the stress it experienced when its protecting neighbours were removed.

High quality, resonant timber could be cut only from the area of closely spaced rings. A board cut from the full width of the trunk would warp as a result of the unevenness of the grain. For practical purposes the only source of good narrow-ringed timber that is firm and regular in its structure and less likely to warp, is a mature tree from a natural forest. A shade-demonder in a natural forest or a plantation that is suddenly exposed to light will show irregular annual rings, an off-centre heart, sometimes heartrot, and radial cracks (called 'shakes') like those shown in Fig. 15.1. Excessive heating, causing sponginess in the wood that often results in heart rot, and encourages bacteria and parasites causes the openness of the grain. This combination of conditions Viktor Schauberger called 'tree cancer.'

The conventional theory is that the movement of sap is caused by osmosis, or by differences in pressure between air pressure and the pressure in the capillaries. However, the absorbent raising action of osmosis is limited, and cannot account for the rising of sap in the highest trees, which can exceed 91m (300ft). Mechanical suction cannot be responsible either, as the limit for drawing up water is



9.81m (32.18ft). Viktor Schauberger found that it had more to do with a metabolic process:

On many occasions I have already stated that the rising of sap in trees cannot be explained by the physical factors hitherto put forward alone, such as the effect of the external air pressure, etc., but that its explanation is to be found in the ongoing metabolic processes in constant pulsation in every cell of the tree and is therefore a result of the vital activity of the capillary tree-cell. Professor Kurt Bergel of Berlin came to similar conclusions in relation to the activity of the heart and the blood in animal life.¹

The healthy movement of sap is stimulated both by the pulsating action and by the extreme fineness of the capillaries to be found in a completely naturally grown tree (Fig. 15.2). When the carbonic acid contained in the water and sap is warmed, it is converted into

Fig. 15.2. Rising sap.

As the day warms bubbles of CO₂ completely fill the narrow capillaries like corks, pushing water, sap and nutrients in front of them. As night cools, the sap sinks, sucking down the CO₂, the sap and the nutrients.

15. THE METABOLISM OF THE TREE

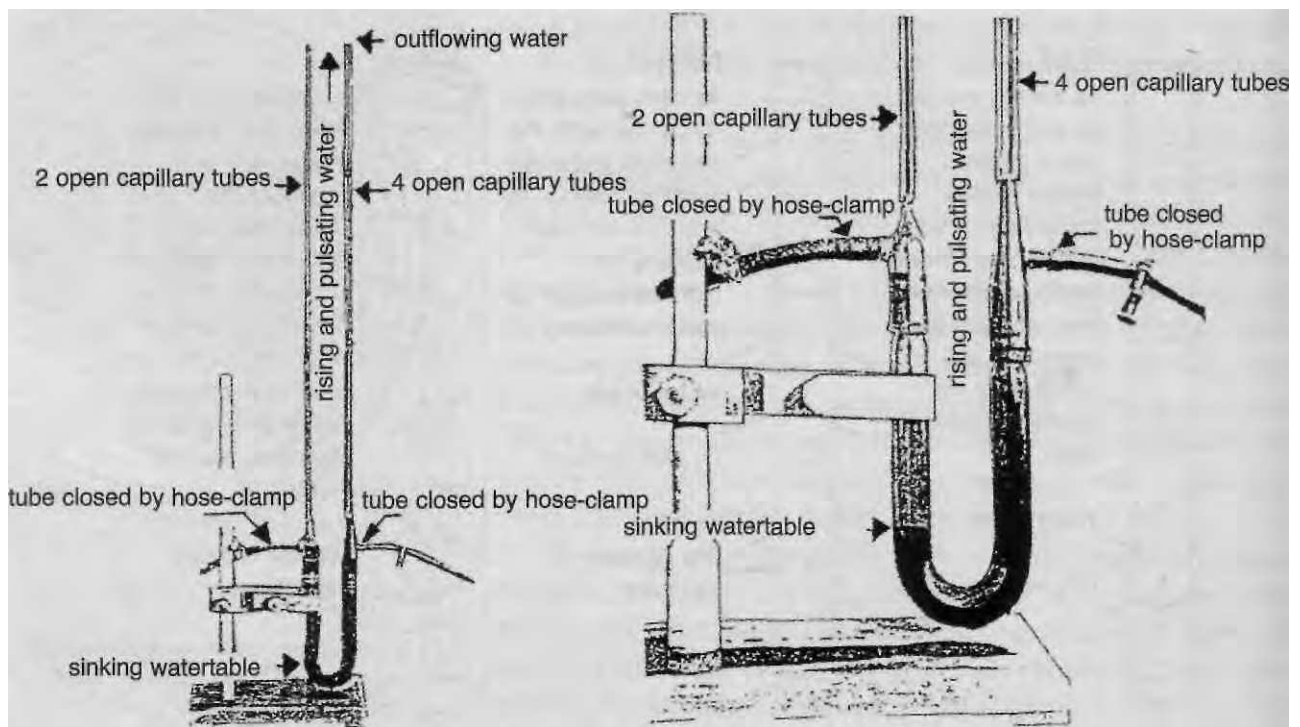


Fig. 15.3. Viktor designed this surprisingly simple but ingenious experiment that anyone can replicate with simple laboratory equipment, which consists of a U-tube, the bend of which is filled with pure quartz sand that is then saturated with salt water. This effectively separates and prevents communication between each side of the U-tube, but the salt water can be displaced laterally when pressure is higher in one arm.

The top of one arm has attached an adaptor to two fine capillary tubes, which allow contact with the air. The other arm has four fine capillaries attached to it. Both arms are now filled with fresh high quality spring water with little oxygen content, which has not been exposed to the Sun, or for long to the air.

The U-tube is then placed in an insulated container, e.g. a bucket, containing ice at the bottom, and then filled with good loam. The ice will create an artificial environment of $+4^{\circ}\text{C}$ (39°F) at the bend of the U-tube, helping to bring about a positive temperature gradient from the top of the loam downwards.

The container is then placed in the heat of the Sun and slowly as the $+4^{\circ}\text{C}$ (39°F) temperature is reached below and the higher water heats up, the water level in the arm with 4 outlets will rise and overflow as there is less resistance on that side, the water on the other side remaining level. The rise in the water level is assisted by the heat of the Sun converting the carbonic acid in the water into carbon dioxide bubbles that push the water bundles ahead of them and pull the water behind, creating a pulsating effect.

During the night the water on the 4-capillary side subsides, the carbonates in the water having absorbed the oxygen and other gases from the atmosphere. This makes it specifically heavier, exerting pressure through the sand barrier on the other side of the U-tube, causing the water level in this tube to rise up its pair of capillaries.

This replicates the natural process of pulsation that happens with all liquids in Nature, a pulsation which is caused by temperature difference, pressure and suction. This experiment sets out to duplicate particularly the conditions under which sap rises in the daytime (the four capillaries representing the xylem tubelets), falling back at night time (the pair of capillaries approximate the delivery of the phloem tubelets).

To demonstrate the action of a natural spring, the adaptor with four capillaries is removed, leaving the shorter side open, so that the water rises and overflows on that side when the temperature difference is greatest between the $+4^{\circ}\text{C}$ (39°F) environment at the bottom of the bucket, and that at the surface of the loam. At night the water drops on the open side, rising on the side with the two capillaries.

carbon dioxide, which forms bubbles. These bubbles act like little plugs and, as they rise, push the intervening packets of water, sap, etc, ahead of them, pumping the water with the nutrients and the sap right up to the furthest extremities of the crown.

The sap rises during the day when the tree exhales oxygen through photosynthesis. When the Sun sets and the temperature drops, this process is reversed as it breathes in oxygen to help build up the root system and the trunk of the tree. Nightfall initiates the retreat of the sap, which becomes denser through cooling and is drawn towards the root-zone. The capillaries in the crown of the tree are evacuated, creating a partial biological vacuum as the CO₂ gas-bubbles condense and begin to sink (see Fig. 15.6).

The CO₂, nitrogen, oxygen, starches, sugars, and trace gases formed during daytime photosynthesis are drawn down through the minute stomata and pores in the leaves, down the trunk, some of them reaching the hair-roots. Their purpose here is to nourish the life-functions of the tree during the night and provide the material for building the structure of the inner fabric of the tree as a whole. As the crown and the trunk cool down, the root-zone warms up and the opposite happens to what took place during the day. This keeps the soil warm during the night and in winter, and cooler during the day and in summer. The ground temperature in this way is prevented from overcooling or overheating, greatly benefiting the micro-organisms in the humus.

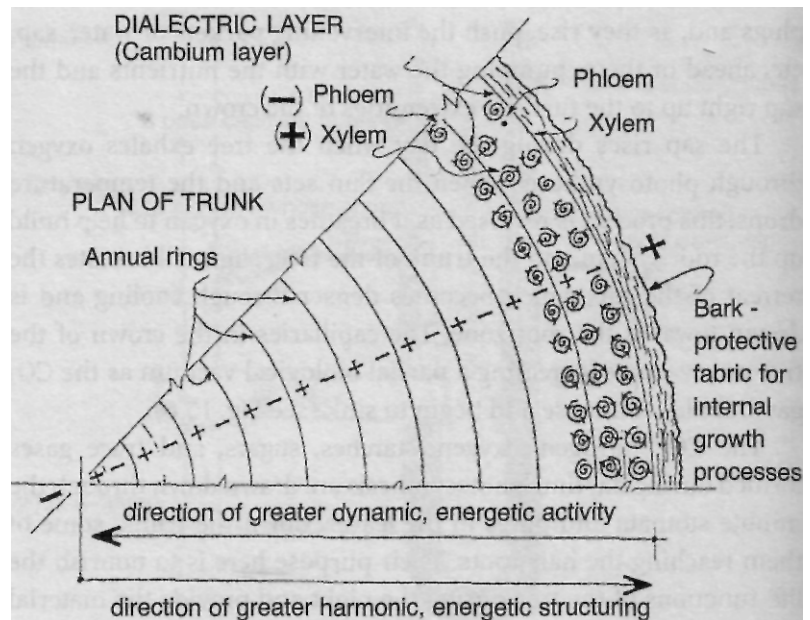
Light-demanding trees are able to work in the same way because they have thick bark or, in some cases, a light-coloured bark with a high reflective factor to protect them from the greater heat and light which would interfere with this delicately balance metabolic process.

The cambium layer (see Fig. 15.4, p. 204) is the active zone where the growth of the tree takes place through the interaction of two electrically charged fluids. The negatively charged phloem containing oxygen, carbon dioxide, nitrogen, etc, flows down the inner side of the dielectric, while the positively charged xylem, containing ionized minerals, salts, trace-elements, carbonic acid or CO₂, flows up the outside. Between these two streams and through their interaction, the proto-annual ring is transformed into a proper annual ring. The life history of the tree is imprinted on these annual rings.

Fig. 15.3 (opposite). Rising sap experiment.

The constant pulsation in the capillary tube mimics the principle of rising sap in the tree, just like the pulsation that causes blood circulation in the body (a propos of which Schauburger also said 'There is no condition of equilibrium in Nature').

Fig. 15.4. Horizontal section through trunk.
This shows how the growth rings act as charge separators or dielectric layers.



Temperature gradients in the tree

Temperature gradients are important in tree metabolism. The areas of active growth in the outer trunk and in the branches need heat energy to sustain the formative elements in a productive, ionized and fluid state for the processes of combination and re-combination to take place.

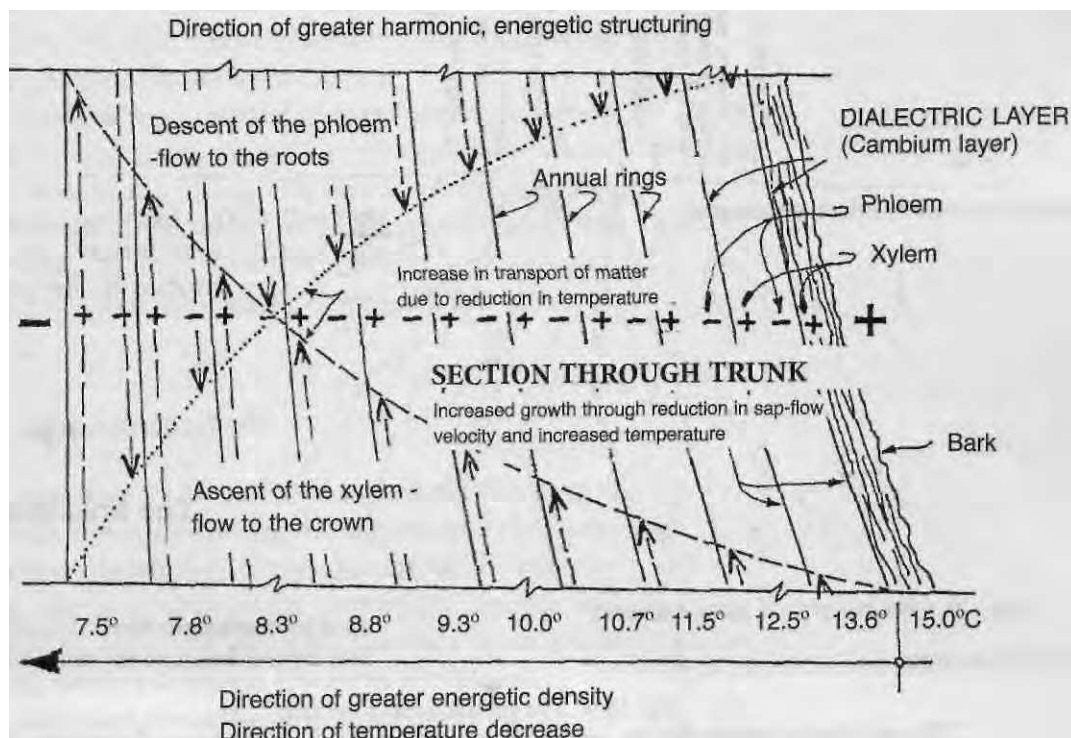
During the daytime, a positive temperature gradient is active from the outside inwards, the cooler, more internal sap rising faster, transporting the finest nutrients up to the top of the tree. They are taken to the foliage, for the small green shoots, flowers and reproductive elements required for the highest quality growth. Viktor Schauberger's measurements showed that this upward flow could be as fast as 3m (10ft) per hour, or 50mm (2ins.) per minute. The lower quality, coarser nutrients present in the outermost layers of the cambium ring (just inside the bark), needed for building the structure of the tree, are raised only as far as their fineness permits, the coarser being deposited in the trunk, the finer later in the branches. The effectiveness of this process depends on a negative temperature gradient being active from the outside inwards (cooler

outside > warmer inside) during the hours of darkness, in its function as depositor or precipitator.

With rising air temperatures, the point where the positive and negative temperature gradients meet within the tree shifts to deeper levels. The flow of the sap becomes more sluggish and the positively charged nutritive elements are held in near stationary suspension at various heights to await the arrival of the negatively charged elements from above. This may be the reason why the Amazonian rainforest stops producing oxygen towards midday. The positive nutrient-transporting temperature gradient soon changes to a negative one as the temperatures rise rapidly during the morning. This arrests the supply of nutrients; photosynthesis ceases and with it, the expiration of oxygen is interrupted.

With nightfall and the cooling air, the temperature gradient reverses to positive from the inside outwards, so that the outer layers of the tree become cooler than the inner. The crown cools faster, causing the sap to sink quickly. The higher temperatures of the Amazon rainforest cause fast evaporation, to bring accelerated

Fig. 15.5. Vertical trunk section. This shows ring temperature decreasing inwards, and the flow of nutrients in the xylem, upwards in daytime, descending at night.



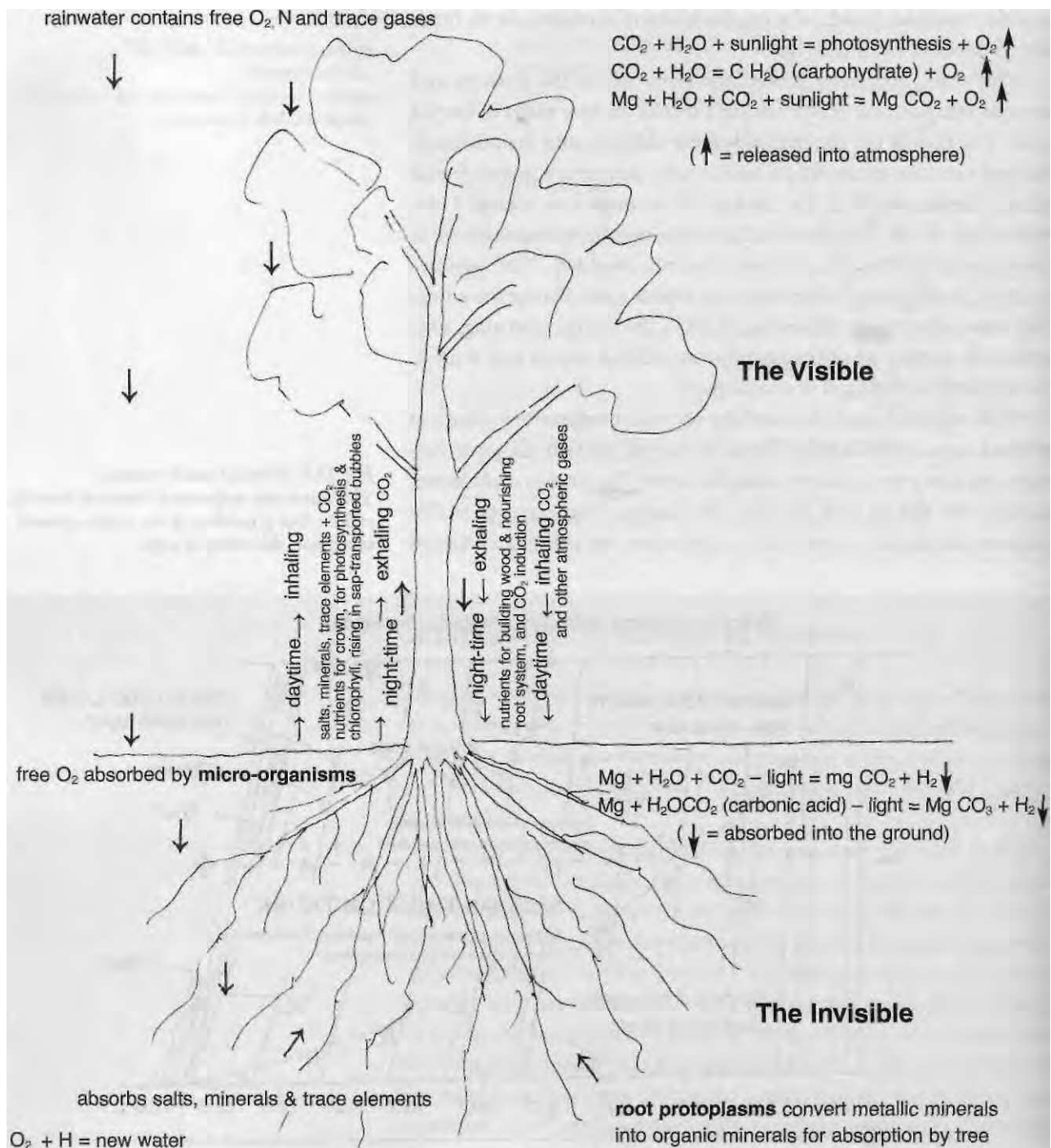


Fig. 15.6. The metabolism of the tree.

The vital exchange between the yang solar and the yin earth energies for the production of photosynthesis, chlorophyll and carbohydrates and its role in the production of water.

cooling of the sap which, sinking after midday, does not reverse direction until the following day. The oxygen and other gases contained in the negatively-charged phloem are drawn down towards the root-zone. By this means, oxygen is made available to assist decay in the upper reaches of the soil, and to stimulate growth around the root tips (Fig. 15.6).

During the night the descending phloem plays another important role. It interacts with suspended positively-charged xylem and because of the prevailing positive temperature gradient (Figs. 15.4 and 15.5) is drawn towards the exterior of the trunk. This produces new wood growth that is made denser and harder with winter cold, forming an annual ring.

In a commercial plantation a shade-demanding tree grows more branches in order to protect itself. The sap is therefore diverted from its normal progress up the trunk to nourish the spurious branches, twisting around the extra knots in the trunk. The excess heat also makes the sap ducts larger in diameter so that the carbon-dioxide bubbles are not able to raise the fluids required for healthy growth. Insufficient nutrients are able to reach the crown of the tree, which is likely to suffer die-back; high quality timber is no longer produced, and the tree will have a limited lifespan. Sprouting foliage shows the height to which the sap is able to rise.

Because of unnatural high internal temperatures there is premature deposition of nutrients, a condition akin to arterio-sclerosis in the blood vessels of humans. The higher temperature also limits the rise of these coarse materials, which are deposited near the base of the trunk, causing a cone-shaped trunk. With its levitational energies thus weakened, such a tree more easily falls victim to storms.

The tree as a biocondenser

We discussed earlier how the formative energies (which belong to the fourth and fifth dimensions) carry the blueprint for the evolution and physical manifestation of all organisms. This life-force carries with it an electrical charge. The process of growth and development of any organism requires that this life-force is enhanced or potentiated by a process known as biocondensing.

As part of its important role in Nature associated with the two creators of life, water and photosynthesis, the tree acts as a biocondenser,

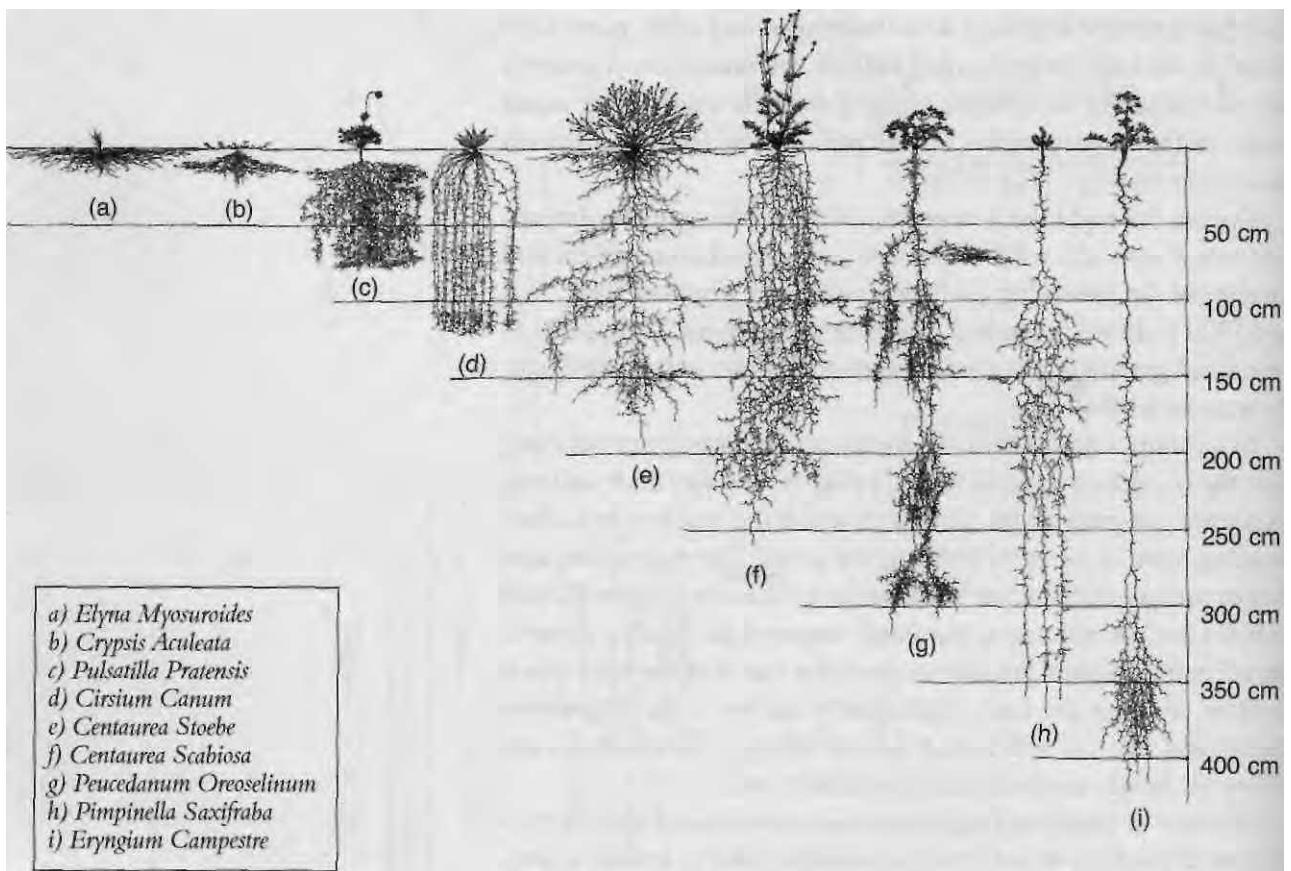


Fig. 15.7. Various root systems.
In the evolution of plants, first primitive ones (a & b) take root, making use of the low-grade nutrients at the warm surface. They allow a little soil and moisture to accumulate. As the soil cools off, the water table slowly rises, bringing up deeper minerals and nutrients. This allows higher plant forms to develop (c to i), which hold the soil together and encourage humus to form, which attracts micro-organisms that break down the soil, increasing the fertility and richness, causing the pioneer plants to die off.

whose purpose is to increase the potency of the life force towards the tips of both branches and roots.

In Chapter 7, we saw how the Earth may become charged with life energy through its terrestrial biocondenser. Trees work in a similar manner, the annual rings forming the dielectric separators between the electrically charged areas. When these are closer together, the potential (the dynamic energy) is increased, which occurs higher up the trunk. In the central part of the trunk some growth takes place, but the most energetic growth happens at the ends of the new shoots.

The diameter of the trunk reduces as the tree grows taller, which makes the annuals rings grow closer together, increasing the bioelectric potential. At the very top of the tree the potential is very high. Finally in the leaves themselves the energy potential is at its maximum. This is necessary for the critical process of evapo-transpiration to take place. The sap capillaries are extremely small, so that the substances

having only the finest materials with the highest of nutritive qualities remain, the coarser having been left behind to build up the structure of the lower part of the tree.

In addition, this refinement of the energy at the leaves gives it a kind of increased homeopathic potency; so that when they receive the highly energized drops of falling rainwater there is an immediate transfer of pure energy or life force. It is therefore hardly surprising that this is where the most intense growth takes place.

These areas of dense growth where the biocondensers are located are finely structured and susceptible to damage, either by being pierced, or disturbed by excessive warming. If this happens, the biocondenser fails, disease sets in and the tree dies.

By inserting copper probes, Walter Schauburger was able to record significantly high electrical charges between the cambium layer and the heart of the trunk, sufficient to light a small flashlight bulb. The healthier and more naturally had the tree grown, the brighter the light observed.

Root systems

The root system, being the invisible part of the tree, has an aura of mystery. A germinating seed puts down a root into the darkness before it sends a shoot into the light. The root system is the complement to the canopy, and its energy exchange system is just as complex.

It is important to see the whole tree as an energy pathway that brings about a marriage of the negatively charged energies of the Earth (a receptive, female system) with the positively charged energies of the atmosphere and the Sun (a radiating, male system). Out of this union comes the primary manifestation of the organism, 'tree' — with its secondary life-enhancing processes of chlorophyll production and photosynthesis.

We are taught wrongly that there is a one-way transport of nutrients from the roots to the leaves. The very fine root tips, with their tiny capillaries, correspond to the new, growing leaves in the tree canopy, and at night the descending energies and nutritive elements contribute to the important processes that these root tips perform.

At the ends of the root tips are tiny protoplasts, little chemical factories that perform the important task of converting minerals from their natural metallic to the organic form that the tree is able

to absorb. They are also responsible for transferring yang energy and nutritive elements derived from the tree crown, to increase the vitality of the soil, without which the micro-organisms would be unable to flourish. In addition, they release hydrogen, which combines with free oxygen in the soil to give birth to new water. So it is clear that these protoplasms perform invaluable functions.

Even a gardener probably has only the vaguest idea of how a root system develops. To hold up the plant stem is one purely physical function. There is, in fact, the widest possible variety of root forms and systems, the diversity of which is essential to healthy micro-environment, because each species' roots go down to a different level in the soil, bringing up different nutrients and energies.

Trees are described as being flat-rooted, heart-rooted, tap-rooted and deep-rooted, the last evaporating more water than heart-rooted trees, and flat-rooted trees evaporating least of all. Each plant species, therefore, has its own particular root structure, which penetrates to a different soil horizon to withdraw the elements it needs. But other plants will share some of these nutrients also. Fig. 15.7 illustrates the wide variety of root systems.

When plants first appeared, about 420 million years ago, climatic conditions were inhospitable, with severe storms and heavy rain. Only the most primitive plants could gain a hold, feeding on the salts and metallic minerals. Although they had very little root growth, the stems above ground were able to trap some nutritive wind-borne dust to form very primitive soil, their shadows having a slight cooling effect on the ground, allowing some moisture to collect.

Soil and nutrition

Cooling was the key to the appearance of water, and as the ground cover spread, the lowering temperature affected the deeper ground, allowing the water table to rise, bringing with it minerals, trace elements and nutritional substances nearer to the surface. This created the conditions for higher quality plants to evolve. Requiring better quality nutrition, these higher plants had deeper root systems that brought up minerals from a different horizon, but were no competition for the pioneer plants.

The more evolved plants held the soil together, trapping more moisture that helped to attract micro-bacterial activity to break down the mineral particles into finer dust, the first step towards the

humus that is necessary for even higher plant forms. The root systems become more complex, interweaving at different levels, so that they cannot easily be separated. Greater fertility brings a richer soil that is of too high a quality for the pioneer plants, which will now disappear. A more favorable microclimate in the higher soil increases the diversity of the bacteria, encouraging more complex root systems.

There is a magical and symbiotic relationship between the various root systems that we cannot easily observe below ground, more complex than the interrelationships of the plants above ground. With greater complexity, and the evolution of trees, the soil takes on the full yin energy potential of Mother Earth, and with it the creation of virgin water, an essential requirement for higher life forms.

This process of soil formation took several million years before larger plants, such as small bushes and trees, were able to gain a hold; and they had to go through thousands of years of evolution before a forest was possible. The forest is the most productive environment for the building up of soil and fertile humus. It is self-fertilizing and self-sustaining. The great forests were able, over a period of thousands of years, to build up twenty feet or more of soil depth. With our heedless disrespect for Nature's bounty, in one century we have allowed these great soil banks to be eroded and destroyed, first through deforestation, and then by careless tilling of the unprotected soil surface.

The web of life that evolves in a natural forest is so complex and sensitive that the removal of key species can cause a depletion of the energy that can lead to a progressive decline of the system, as more species fail for want of the sustenance that was provided by the missing species. A hole is created in the complex root network that is the interconnecting link between the deeper ground and the surface. The root system raises the water table. A missing species also means a hole is created in the water system that supplies the nutrients. Over time, a shortage of nutrients puts more plants under stress, leading to more species disappearing.

Something like this happens with our monoculture systems, for the nutrients are not able to rise through the crusty layer formed at the level to which all the same species' roots descend. This leads to depletion of fertility and all the energies associated with it; uniformity means sterility, something that Nature abhors.

PART FIVE



Working with Nature

16. Soil Fertility and Cultivation

Our primeval Mother Earth is an organism that no science in the world can rationalize. Everything on her that crawls and flies is dependent upon her and all must hopelessly perish if that Earth dies that feeds us.

Viktor Schauberger¹

The crisis in intensive farming

When there was great enthusiasm in the 1930s for the much publicized glamour of industrialized agriculture, Viktor Schauberger was very aware of its pitfalls, developing a number of field tests which demonstrated the fallacy of the new technologies. Though he did not live to see the dramatic agricultural catastrophes of the 1990s, to a large extent he predicted them.

Intensive farming developed first in the Americas, where the limitless vast open plains could be cultivated or grazed in only very large units. At first in North America, and then on the South American plains, this meant enormous herds of cattle or highly mechanized crop cultivation. Because of the inevitable depletion of minerals and, as a consequence of monoculture, intensive farming of this kind soon leads to the widespread use of chemical drugs or artificial fertilization with animals, and herbicides with cultivation. By its very nature intensive agriculture is unsustainable, but it is a big and profitable international industry and, as we all know, we are living at a time where big profits count for more than human or ecological values.

There is a growing interest in sustainable cultivation, and there are many books on the topic. It is impossible to grow crops without a loss of fertility in the soil. We shall be examining different methods of fertilization from the inorganic to increasingly higher organic and energetic processes. Viktor Schauberger's whole research was deeply committed to improving food quality and soil fertility. He had original ideas about fertilization, but his most intriguing ideas were concerned with amplifying the subtle energies of the planet to bring about higher quality in the plants themselves.

Ploughing methods

Viktor Schauberger's interest in soils was initiated during a visit to Bulgaria in the 1930s where he had been commissioned to build a log-flume. King Boris asked him to look into the decline in soil productivity and the shrinkage of the water table in the northern parts of the country since the introduction of modern mechanized farming methods. The southern part, on the other hand, was still fertile, with abundant moisture.

Viktor found that in the poorer southern part of the country, populated largely by people of Turkish origin, the fields were tilled with traditional wooden ploughs pulled usually by teams of women. These fields remained very fertile and productive, with high crop quality. In the north, however, the fields were ploughed with tractor-drawn steel ploughs. As he was aware of the destructive effect that steel and iron have on water in the soil, Schauberger attributed the disappearance of the water and the poorer yields to the use of the steel ploughs and the faster ploughing in the north. This knowledge led him to invent a new kind of plough and to do a number of experiments on improving soil fertility. Before going into this, however, we need to understand more about electromagnetism.

Two kinds of electromagnetism

Viktor already recognized that in Nature there are two types of electromagnetism, just as there are two kinds of temperature change. The one that encourages growth and stimulates energies in all organisms he called biomagnetism or bioelectricity; the elements connected with this form of electromagnetism (diamagnetism) are copper, bismuth and gold.

The other, ferromagnetism, usually just called magnetism, when combined with an electric current, is the form that is commonly used in electric motors and dynamos for the generation of electricity. In Nature this form of energy is used to break down substances. In water's case it disintegrates the water particles into its constituent atoms. The elements of ferromagnetism are iron, nickel and cobalt.

The golden plough

Wherever we look, the dreadful disintegration of the bridges of life, the capillaries and the bodies they have created, is evident, which has been caused by the mechanical and mindless work of Man, who has torn away the soul from the Earth's blood — water.

Viktor Schauberger²

Viktor observed how steel ploughs damage the soil. Drawn rapidly through the ground, the hard steel ploughshares generate minute ferro-electric and ferro-magnetic currents that decompose the nutrient-laden water molecules in the soil, in a manner similar to electrolysis, resulting in water loss. The surface tension of the water molecule is reduced, the soil loses its energy potential and its nutritive subtle energies are dissipated. This not only destroys the soil's subtler energies, but also converts the nutritive elements or removes them from the mature water molecule. The residual water becomes pure juvenile water that has no nutritive value.

Abrasion with the soil removes tiny particles of steel from the cutting surface of the plough, which break down to rust, an ideal breeding ground for harmful pathogenic bacteria. An increase in the iron content of soil inhibits its water retention. On the other hand, soils high in copper have the capacity to retain greater quantities of water.

The delicate soil capillaries that deliver nutrients and water to the surface, and some of the micro-organisms that process them are destroyed by the heat-producing friction and the compacting pressure of the steel plough. As the normal supply of nutrients from below is cut off and the water table falls, the soil fertility suffers.

Schauberger started to experiment with copper, initially as a plating of thick copper over a conventional steel plough. The destructive ferro-electromagnetic effects of the steel plough were thus replaced by beneficial bioelectromagnetic ionization, enhancing growth and soil fertility. Because of the remarkable results it achieved, this came to be known as the 'Golden Plough.'

Field trials were conducted near Salzburg in 1948 and 1949 to compare the results of the new plough with the conventional steel plough. Fields strips were ploughed, alternately using steel and

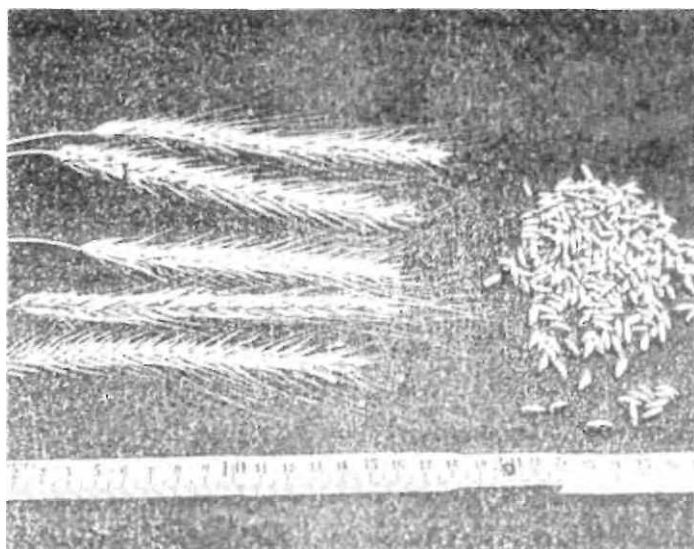


Fig. 16.1. 15 cm long ears of rye with up to 104 grains/ear.

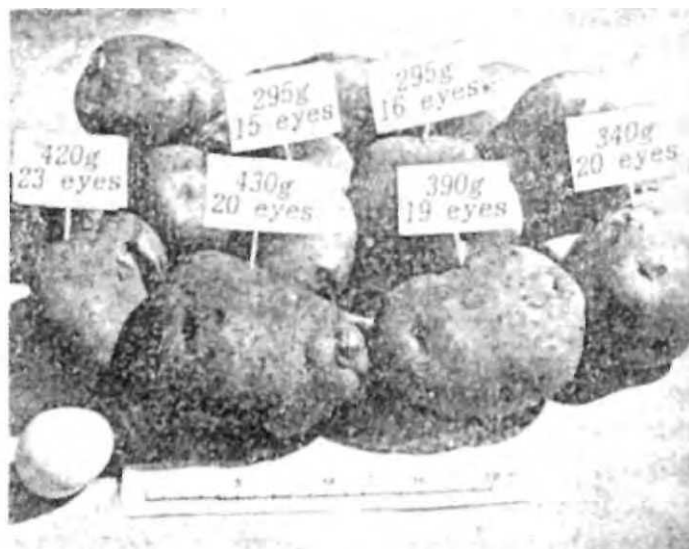


Fig. 16.2. Potatoes grown on Alpine farm at Kitzbuhel, Tyrol.

copper-plated ploughs. When the grain came up the differences between the alternate strips was quite apparent. Where the copper-plated plough had been used the water content and the nutrient energies of the soil had been increased, and the corn stood about 6-8 inches higher with a much fuller head. Some yields in the strips ploughed with copper-plated implements increased by up to 40% compared to the control strips where conventional steel ploughs were used. As all other factors of soil chemistry, orientation, furrow width, etc., were identical, the difference in yield was clearly due to the use of the copper plated plough.

With two crops there were spectacular results. 15cm long ears of rye produced an average of 104 grains each (Fig. 16.1). In another experiment in Tyrolean Kitzbuhel potatoes weighing nearly half a kilo, containing over twenty eyes' (the source of next year's crop), were produced (Fig. 16.2).

The Bio-plough

The conventional ploughshare forms a pressure wave and makes a crushing cut that destroys the soil capillaries. Schauburger in 1948 encouraged a Hamburg engineer Jurgen Sauck to develop a sharp curved blade to create a long slicing cut before the soil is centripetally involuted in a figure of eight motion through the curving wings of the phosphor-bronze ploughshare, copying the burrowing

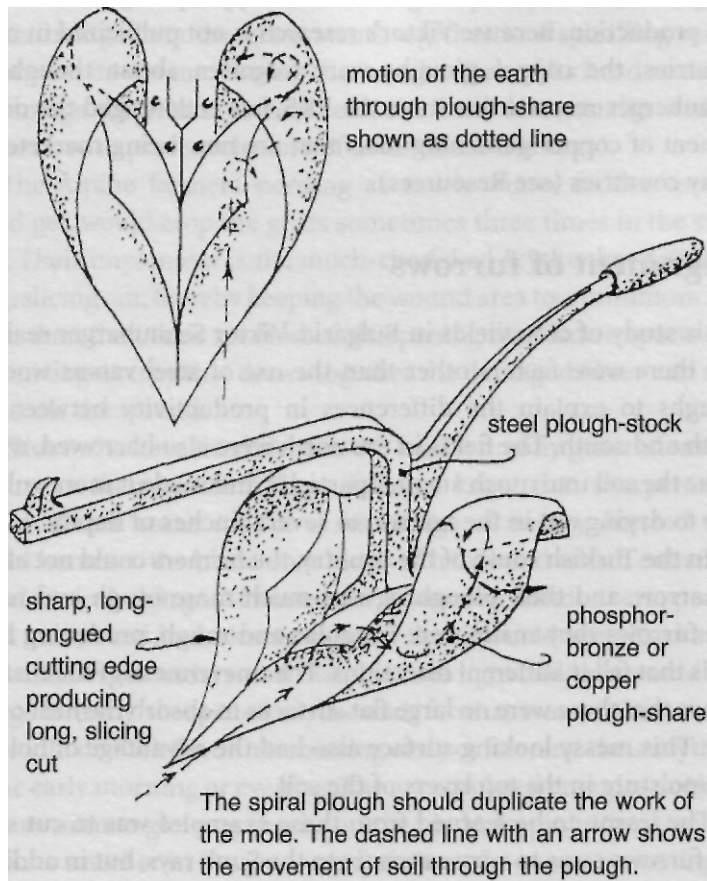


Fig. 16.3. The bio-plough, 1948.

action of the mole. This was called the bio-plough (Fig. 16.3) because it enhanced the energy in the soil. Its action was to rotate the soil through 360° , so that what was originally on the surface was returned to the surface. This minimized water loss and the sub-surface micro-organisms were never exposed to direct sunlight (heat) and could continue their work undisturbed.

These experiments clearly proved the great advantage of the copper-based ploughs. The great increase in productivity with their use would quickly recover the cost of replacing iron or steel ploughs. The trials had created a lot of interest, but Viktor came up against bureaucratic corruption that defeated his plans. Copper being in short supply just after the war, he had to go to the Ministry of Agriculture to obtain what he needed. It is alleged that the Minister was being seduced with large bribes by the chemical companies to introduce chemical fertilizers, and indicated that he expected Viktor to do the

same. Of course Viktor would not, so the copper ploughs never went into production. Because Viktor's research is not publicized in other countries, the copper ploughs were forgotten about, though the Schauberger research institute, the PKS, has encouraged the development of copper gardening tools that are now being marketed in many countries (see Resources).

Alignment of furrows

In his study of crop yields in Bulgaria, Viktor Schauberger realized that there were factors other than the use of steel versus wooden ploughs to explain the differences in productivity between the north and south. The fields in the north were also harrowed, which broke the soil into much smaller particles and made it more vulnerable to drying out in the hot sun to several inches of depth.

In the Turkish south of the country, the farmers could not afford to harrow, and their ploughing was much more rough and ready. The furrows they made were irregular and rough, producing large clods that fell in different directions. The unevenness of the furrows meant that there were no large flat surfaces to absorb the heat of the Sun. This messy looking surface also had the advantage of holding the moisture in the top layers of the soil.

The lesson to be learned from these examples was to cut sinuous furrows so as to vary exposure to the Sun's rays, but in addition to give them a north-south alignment, so that the inclined surfaces of the furrows would be shaded for part of the day and exposed to the Sun only when it was low in the sky. This meant that the young growing sprouts had the maximum amount of moisture when most needed.

Grazing and grass cutting

Conventional mechanical grass mowers have an effect on the grass similar to that of the standard iron plough on the soil. The inclined blade uses a crushing action that damages the capillaries of the grass stalks, and shreds the top of the stalks for several millimetres, allowing the grass to bleed and bacteria to enter. Instead of applying its energies to new growth, the grass stems have to heal the wounds, which can take a week.

Viktor Schauberger's observation of animals was profound. He

would watch the cows on the fertile high Alpine pastures. The grazing animal gathers the grass stems together in a spiralling movement with its tongue, cutting them with a jerk of its head so as not to damage the stalks. It then seals the ends of the stalks with its moist nose to prevent the loss of moisture and energy.

The Alpine farmers needing as much winter fodder as they could get, would crop the grass sometimes three times in the summer. Their implement is the much-cherished scythe that delivers a long, slicing cut, thereby keeping the wound area to a minimum. But more than that, their method of sharpening the blade imparts to it an ionizing energy that draws together the damaged fibres and rapidly seals the wound.

Those who have lived close to the land for many generations use Nature as their teacher. These farmers knew that sharpening a scythe with a stone robs it of its charge of energy. Instead they would hammer the blade on a block of hardwood which enhanced the electrical charge. Mounted on a wooden handle, wrapped in cloth and stored in darkness ensured that it would keep its charge.

Schauberger understood that the Sun's light and heat would discharge a newly sharpened scythe and, for that reason, these farmers would do their blade hammering early or late, and their scything in the early morning or evening. The accumulated energies could be seen as minute glowing sparks on the blade, leaping from one serration to another in the growing darkness of a summer evening.

We have lost this knowledge, and today soil fertility and productivity are in dangerous decline, ironically, because of the heavy use of artificial fertilizers as well as misguided techniques.

Artificial fertilizers

Contemporary agriculture treats Mother-Earth like a whore and rapes her. All year round it scrapes away her skin and poisons it with artificial fertilizer, for which we have to thank a science that has lost all connection with Nature.

Viktor Schauberger³

The pioneer of modern artificial fertilizers was Justus von Liebig (1803-1873), a German chemist. His research into the elements and chemicals required by plants for growth found that four principal minerals were often deficient in agricultural soils. To increase fertility he advocated the supplementation of calcium (Ca) in the form of

lime, nitrogen (N), phosphorus (P) and potassium (K), the last three often referred to as NPK.

These products are soluble and mostly they are by-products of what Viktor Schauberger called 'fire-spitting technology' They are produced by heat, which is structure-disintegrating and energy-depleting and applied by either spraying or by powder diffusion.

Chemical companies were quick to manufacture these new products as a way of turning waste material to profit. Liebig later realized that the ingredients necessary for healthy plant growth were far more complex than simple NPK. Indeed he warned that dependence on these basic chemicals could irreparably damage the soil, but nobody was listening. The rapid spread in the use of artificial fertilizers led to a systematic depletion of soil fertility as it lost its organic base. A highly mechanized system of cultivation, using steel ploughs and artificial fertilizers reduced large tracts of mid-western America to dustbowls, forcing the ruined farmers to leave their land. The same is now happening in many third world countries, like India, where multinational chemical companies are demanding the replacement of traditional methods in favour of chemically dependent agriculture.

When the dependence on chemicals was first exported, it was called 'the green revolution,' because their use was linked to increased yields. However, this was quantity at the cost of continually decreasing quality, profit at the expense of life (see Chapter 5). Artificial fertilizers are stimulants to growth and act like narcotics on which the soil becomes reliant. The soil, now dependent on the chemicals — rather like drug addicts who as their physical condition worsens, require more and more shots to extend their lives a little further — is also dying.

In their finely powdered form, artificial fertilizers are moisture demanding, robbing the lower ground strata and the young plants of moisture. With insufficient moisture, transpiration is reduced and the plants' internal temperatures rise, making them more susceptible to disease. These fine powders block the vital capillaries, which supply naturally derived nutrients, mature water, and conduct rising immaterial energies. This makes it more difficult for the plants to absorb rain, resulting in rapid runoff and faster re-evaporation. Irrigation, with virtually worthless water, now becomes a necessity. It is not surprising that the crops grown in such conditions are neither particularly tasty nor nourishing.

HIDDEN NATURE

Excess nitrogen can also introduce another problem — which makes ionized substances less available for root development, leading to further water shortage for the plants. Nitrates have negatively charged ions (anions $^-$) that capture the positively charged ions (cations $^+$) of elements such as magnesium and calcium, removing them from the root zone. Magnesium is essential for chlorophyll production.

Nature's remedy is to bring in parasites (the 'Health Police') to remove the diseased organisms, requiring the application of pesticides and fungicides. After passing on a pesticide-treated crop to the consumer, the ground is fumigated with poisonous gases injected through plastic sheets, to eradicate these supposedly pernicious pests. Everything dies — earthworms, micro-organisms and beneficial bacteria alike. A diverse biosystem gives way to a lifeless desert. The green revolution was justified as a way of feeding the world, just as is biotechnology today. The holistic biologist Mae-Wan Ho gives many examples of how sustainable organic agriculture can be more productive than chemical farming, which is both unsustainable and destructive of life.⁴

17. Organic Cultivation

Biological agriculture

The health of the topsoil is the most important factor in sustainable agriculture. Topsoil is created by decayed vegetable matter, and can vary in depth from a few centimetres to several metres. Forests created the deep soils of the world over millennia, and many of these have shrunk by as much as 80% in the last two hundred years through our disastrous agricultural practices.

Under natural conditions the friable soil is populated with an abundance of earthworms and other creatures and is usually capped with a layer of humus, formed of decomposing leaves and other vegetable matter, and colonized by a profusion of microbial and creepy-crawly life. This rich mixture of life forms makes up a processing factory essential to soil health and fertility, and everything should be done to help it flourish.

Soil remineralization

In 1894 an agricultural chemist and contemporary of Justus von Liebig, Julius Hensel, published *Bread from Stone*, a valuable book describing the beneficial effects of fertilizing with rock dust, a by-product of road metal quarries. His book, posing a significant threat to this new chemical fertilizer industry, quickly disappeared, bought up and killed off by those who felt challenged by it.

Ideally ground in a cold process that retains its inherent energies, this rock dust is composed of finely ground, mainly igneous rocks (such as granite, basalt, etc.) with a broad mineral spectrum. Because of its great range of minerals, trace elements and salts, when spread on the ground, it encourages a wealth of different micro-organisms.

There has been limited use of rock dust in Switzerland for 150 years. However, its reintroduction has been encouraged by John Hamaker and Don Weaver who in 1975 brought out *The Survival of Civilization*.¹ They describe how important are mineral and trace elements to plant growth and quality, but also that trace elements

are a vital moderator of climatic extremes. They also tell how John Hamaker was able to increase the depth of the topsoil at his Michigan home, from about 10cm (4in) to about 1.2m (4ft) over a period of 10 years.

More recently in Western Australia, an experiment by Barry Oldfield for the 'Men of the Trees' showed a remarkable increase in the growth and health of seedlings planted with rock dust compared with those without. Rock dust is easily available as a by-product of road metal quarries.

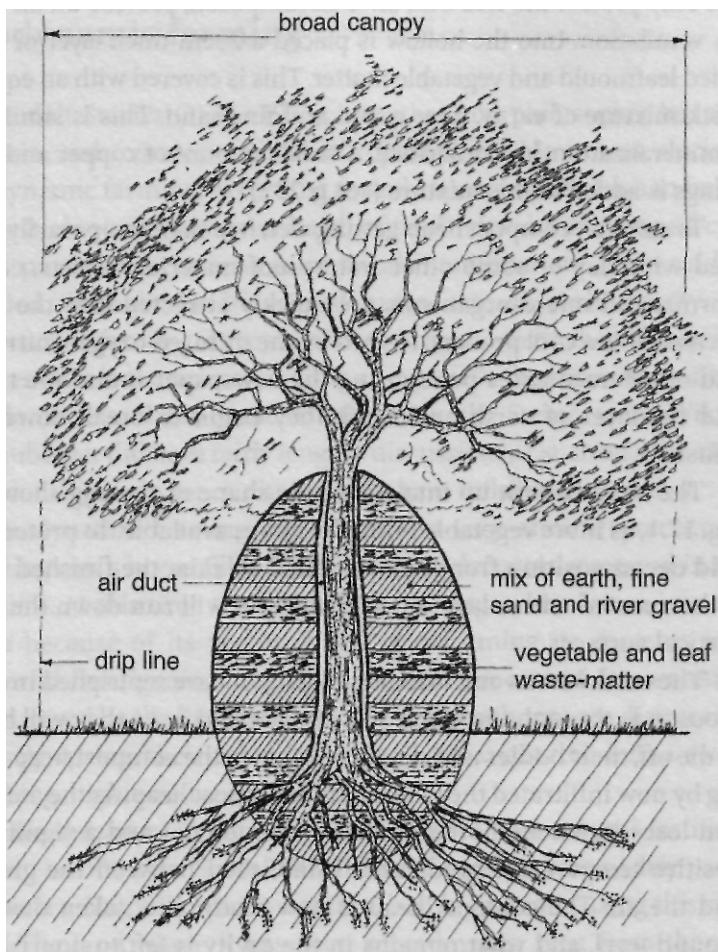
An initial application of very fine rock dust will quickly attract micro-organisms, but a mixture of small and large grains will allow a slow release over a longer period. Rock dust has been shown to be a buffer against nitrate, sulphur dioxide and nitroxide, and it absorbs and fixes the negative ions while saving the positive ions for the plants' use. Normally rock dust is applied about every five years, the quantity depending on soil deficiency, although it is always beneficial.²

It is thought that the remarkable longevity (up to 140 years) and health of the Hunza people of Northern Pakistan is as much due to the mineral-rich glacial water, as to the clean mountain air. Callum Coats tells of his neighbours in Queensland who fertilized their fruit trees from a bucket of rock dust. Their dogs, who would eagerly drink rainwater from this bucket, while leaving their usual water bowls full, clearly knew what was best for them.

Organic farming

Organic farming normally uses manure (generally cow's), farmyard slurry and composted vegetable matter to increase the soil's fertility. The introduction of chemical fertilizers in the nineteenth century was popular and soon supplanted the traditional organic method, because it was much less labour intensive, and appeared to give higher crop yields. A few farmers retained the traditional methods and, as the evidence has built up of the pollution of the water table and rivers by these chemicals, there has been a renaissance of organic farming in the last fifty years.

The sustainability of organic farming derives from the recycling of organic material to maintain its fertility, just as in a natural forest. Modern organic composting tends to use green vegetable matter rather than dried, interleaved with layers of earth. Significant



heat is generated in the pile in this way. Though the compost may seem to be of good quality, Viktor Schauberger believed that as the heat discourages earthworms, it will not be of the best quality. His preference is a cold process that produces a higher content of protein and other immaterial, fructigenic energies. He also believed it important to protect the compost from element-hungry juvenile rainwater that will tend to leach out some of the nutrients.

Although shown here on a small scale, the same principle can be applied to larger compost heaps. Schauberger preferred an egg-shaped compost heap built up under a large fruit-tree with a broad canopy as shown in Fig. 17.1.

A hollow is dug out of the ground round the base of the tree whose trunk is then wrapped loosely with several layers of newspaper, which

Fig. 17.1. The egg-shaped compost heap.

not only protect the tree but, once decomposed, provide an air duct for ventilation. Into the hollow is placed a 20cm thick layer of Sun-dried leafmould and vegetable matter. This is covered with an equally thick mixture of earth, river gravel and fine sand. This is similar to remineralization, just described. A small amount of copper and zinc filings is added to this mixture (see p. 232).

To stop the compost heap getting wet, it is then temporarily covered with clay or some other waterproof material. Insects, earthworms, and micro-organisms are quickly attracted into the heap because it is a cool process. Helped by the diffused oxygen, nitrogen and other trace gases penetrating the newspaper round the trunk and the layer of earth and sand, they begin to break down the refuse.

The heap is built up into the stable shape of the egg shown in Fig. 17.1, as more vegetable refuse becomes available. To protect the cold decomposition from being spoiled by rain, the finished heap is then coated with a layer of clay. Any rain will run down the near vertical surfaces.

The earthworms and microbes will now have multiplied in their thousands through the whole pile and aerated it. As they will begin to die off, their bodies add nutritive value to the compost heap, having by now infiltrated the whole of the compost heap. As the autumn Sun loses its strength, the ground starts to cool and a significant positive temperature gradient is established between the ground and the air. The compost heap is now ready; it is taken down to ground level, and what remains in the cavity is left to nourish the tree.

The material is spread evenly over adjacent fields towards evening, for under the positive temperature gradient — most powerful at this time — rain or dew will carry the nutrients into the ground. This method produces a far richer and higher-quality natural fertilizer, which not only maintains, but actually increases fertility. The host tree also benefits and will produce a copious crop of healthy, tasty and blight-free fruit. Such compost heaps may be built under different trees each year, eventually fertilizing all the fruit trees. If there are no suitable trees, similarly constructed heaps can be built as dome-like humps or barrel-shaped clumps, protected from rainwater and insulated from the heating effect of the Sun.

Biodynamic farming

Dr Rudolf Steiner (1861-1925), a teacher and philosopher born in Austria, and founder of the Anthroposophical Movement, devised biodynamic farming. According to anthroposophy the human being is the highest expression on Earth of the Divine, incarnating all creative power and patterns of physical manifestation. The world is studied through the inner and outer natures of humanity. Its approach to farming is very similar to Schauberger's, the assumption that energy is the primary cause, and growth the secondary effect. While it has been mooted that Rudolf Steiner and Viktor Schauberger did have fairly lengthy discussions, if such was the case, it is not clear how much either might have influenced the other.

Biodynamic farming recognizes the very ancient practice of burying cow's horns filled with cow dung deep underground in the autumn. At this time the active Earth's energies are drawn into the horn because of its vortex shape, transforming its contents into powerful fructigenic energies by the cold process of fermentation encouraged by the low temperatures. The cow horns are disinterred in early spring, their contents having been converted into a sweet smelling, highly active substance.

This empowered material is the basis of the natural fertilizer known as '500 mix.' Since 1947, it has been increasing widely used, and over a 1 1/4 million acres are fertilized in Australia using this system. The land where it has been spread, when seen from the air, stands out clearly from neighbouring farms, due to the much greener pasture. Some cows from farms bordering Alex Podolinsky's did not eat for two or three days after they had broken into the biodynamic farm, so high was the quality of the grass they had consumed.³

The '500' mix fertilizer is produced according to an ancient Alpine tradition which Schauberger himself once observed being practised by an old mountain farmer who achieved amazing results from his fertilizer. The principle is like that of homeopathy. When a homeopathic medicine is made, the original remedy is stirred and shaken between the dilutions, which increase its potency. With the fertilizer a small quantity of the converted cow dung is added to water and stirred first in one direction and then in the other, so as to create vortices rotating about the vertical axis

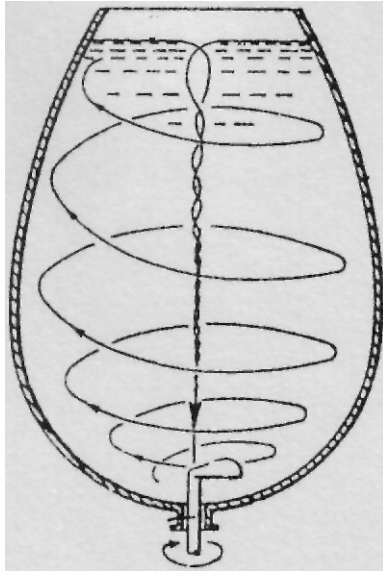


Fig. 17.2. Motor-driven mixing device with golf club-shaped impeller.

of the mixing vessel. A left-hand vortex builds up the positive energy and the right hand vortex creates a negative energy that draws in the inseminating O_2 . The alternating energy charge builds up the inherent energies of the 500 mix. This recalls the alternating left and right hand bends in a river building up its energy in a longitudinal vortex (see p. 143).

This method of progressively raising energy is analogous to the Japanese art of sword making. The base material is heated in the furnace, and then beaten out or 'structured' with a hammer as it cools. It is then further heated to incandescence, folded over on itself, fused together and beaten out again. Each time the heating partially breaks down the structuring created by the beating. But with repetition, the structure is cumulatively enhanced and the level of chaos is diminished, ultimately producing a razor-sharp blade whose structure is both laminar and flexible. In a similar way, as the vortices are alternately formed and destroyed in making the fertilizer, the level of energy rises and the degree of chaos decreases until, after about an hour, the product is ready for use. This is sprayed on the fields towards evening within two to three hours of preparation and before the accumulated energies have dispersed.

In order to produce larger quantities of the 500 mix, motor driven paddles are used in cylindrical vessels. Viktor's son, Walter, found that the energies build up more strongly in an egg-shaped vessel, and he devised one (Fig. 17.2) using a simple blade like a gold golf club head as an impeller to infuse carbon-dioxide permanently into water under a partial vacuum.⁴

The farmer that Viktor watched also sang into the brew, rising tones as he stirred to the left and falling tones as he stirred to the right, adding crumbling pieces of aluminium-bearing clay into the water. The chanting builds up creative energy in the water's memory (see p. 108, homeopathy). After about an hour the mixture was ready to be spread over the fields. The following morning he did this by dipping a branch with small leaves into the barrel and then flicking the energized clay-water emulsion over the ground, rather like holy water is sprinkled with palm fronds on Palm Sunday.

Viktor Schauburger's methods of producing natural fertilizer were similar to Rudolf Steiner's biodynamics, but they did not depend on the thousands of cow horns used by Podolinsky, which are available now only because of the high demand for beef. Ultimately such a supply is non-sustainable, when you consider that in

Costa Rica, a recent study showed that for every beef carcass exported, 2 1/2 tonnes of top soil were irretrievably lost through erosion. For a year's food, a meat eater requires the produce from about 1.6 acres, a vegetarian only 0.66 acres. (These are good arguments for switching to vegetarianism).

The role of subtle energies in nature

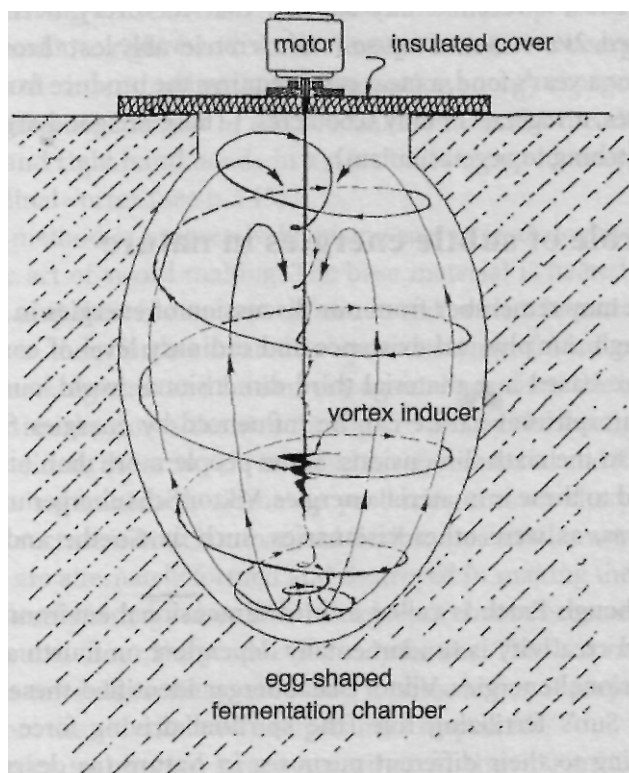
As you may remember from our discussion of energies in Chapter 2, though our physical existence and ordinary level of consciousness are based in a material third dimensional world, our psyche and our spiritual nature can be influenced by energies from the fourth to the sixth dimensions. Some people more than others are attuned to these immaterial energies. Viktor Schauberger undoubtedly was, as were other visionaries, such as Goethe and Rudolf Steiner.

Although Earth is called a third dimensional environment, all life and creativity is fundamentally dependent on fourth and fifth dimensional energies. Viktor Schauberger identified these aspects of the Sun's fertilizing role (the spiritual driving force of life), according to their different purposes in Nature (as described in Chapter 2). Dynagens generate higher intrinsic energy; fructigens are those subtle energies that produce greater fertility; qualigens create greater quality. Schauberger believed that there was no more powerful way to stimulate high quality growth than by seeding these dynamic energies directly on the soil. As in any area of creativity, the balance of the positive and negative, the male and female energies are all-important.

The Tibetans, who had a practice to bury so-called 'treasure vases,' knew long ago about the seeding of the soil with immaterial energies in certain propitious places. Filled with precious stones and metals, these containers were believed to discharge beneficial energies that enhanced and protected the environment. The Tibetans believed that gold and other precious metals were best left undisturbed in the ground as they help to balance the earth energy, just as the Hopis and the Australian aborigines regard places with uranium as sacred.

Schauberger's vision was to create a greater abundance of creative animating energy, of fertility and rising quality. To do this involved a process that sounds more alchemical than scientific. It

Fig. 17.3. Egg-shaped fermentation chamber.



required the mixture of small amounts of the male elements of silver, zinc and silicon, with the female gold, copper and limestone, brought together in a special container. For the more precious elements, gold and silver, only a few particles will easily raise the quality of the resulting fermentation. The copper and zinc are in the form of filings or powder.

As a container he used an egg-shaped fermentation chamber scooped out of the ground about 2m (6 1/2ft) deep, and lined with aluminium-bearing clay (Fig. 17.3). A wide range of organic material, kitchen refuse, animal and human waste, as fresh as possible, is now added, up to one third of the volume. The remaining space is then filled with well-oxygenated, juvenile rainwater or surface water, well exposed to the Sun. The top opening is now sealed, so that energies emanating from the interaction of cosmic and geospheric forces will not be dissipated. A bronze rod with a bio-metal (silver plated copper) vortex-inducer driven by a small motor is inserted through a hole in the cover.

The liquid is stirred in a clockwise (what Schauberger called 'planetary') motion:

'Planetary motion' produces an inward spiralling of the liquid, reducing the outward pressure on the peripheral wall-surfaces, while cooling and densifying. This planetary motion, or vortex, involves the natural, animating, centripetalizing acceleration of mass, which initiates higher-grade fermentation processes of an invigorating nature in the bipolar mixture of basic elements. The end-product is biomagnetism, a reproductive, regenerative and upwardly evolving form of energy.⁵

As well as the biomagnetism there is produced a cooling towards the pivotal +4°C (39°F) anomaly point due to the vortical movement in the liquid. The egg-shape ensures that the particles are thoroughly mixed and reduced to the smallest possible particles, homeopathic in their effect, which Viktor notes:

In terms of homeopathic principles and attempts to produce super-dilutions in order to still the 'specific' hunger of the plants, the more dilute the fertilizing agent, the more it approximates the character of the above ethericities, thus facilitating further interactions that in turn result in increased growth.⁶

There is a mystical dimension to this process, which is like mixing elements of Earth and Heaven. This produces a highly active negative or fructigenic potency, which combines with the water, making it crystal clear. It is also free of unattractive odours and indeed is sweet-smelling, like Podolinsky's '500 mix.' Viktor Schauberger claimed the fertilizer is so powerful, that two such fermentation chambers would be sufficient to permeate the soil over several square kilometres with fertile substances that will encourage germination.⁷

Viktor compares this process to winemaking, where sweet and turbid grape-juice matures into clear, relatively dry wine in a cool cellar. The maturation of good wine, however, may take a year or more, whereas this extraordinarily procreative liquid takes only two to three nights to prepare, weather conditions permitting. When broadcast over the fields in the evening, it absorbs the predominantly positive

17. ORGANIC CULTIVATION

atmospheric energies ready for fertilization by the Sun's energies the following day. As Schauberger observes: 'Thus, apart from a purely sexual process of procreation, a process of higher genesis here confronts us with the ability to endow quantity with quality.'⁸

Cold fire

Viktor Schauberger has described an eerie experience he had with dynagen ethericities, which in this case produced what is known as 'cold fire,' a strange bioelectric phenomenon:

Over thirty years ago, walking in a virgin, Alpine forest, I came upon a flattish mound covered with vivid green grass and a profusion of bright flowers that did not seem to belong in those surroundings. It was close to a gamecock's courtship display ground, so I decided to spend the night in this remote spot, in order to witness these fine birds display at daybreak. Towards midnight, I was roused by a bluish-white flame curling up from the mound and jumped up to extinguish this incipient forest fire.

In the meantime the flame had grown a metre high and took on an egg-shaped form, similar to those that now and again issue from rock fissures and, like shining dewdrops, stand on the point of a rock. Many years ago a chief forester from Vienna, Walter Hackel, photographed just such a strange light over a metre in height. A copy of the photograph was unfortunately lost at the end of the war, or rather was stolen by looters of my apartment.

However, at that time I knew nothing of these things and so I backed away in horror, as I stood in this pitch-black darkness before an ever more powerfully flaring and heatless flame, which threw a pale glimmer into the surroundings. At first, like a man possessed, with my heavy mountain staff, I hit at the place from where tongue after tongue of this mysterious egg-light sprang up. When I noticed that this shaft of light sprang from the rock at only one point, I ceased to flail away at the supposed forest fire and loosened the surrounding soil. This, however, had no effect.

Then I held my hand in this egg-light and instead of feeling the anticipated heat, experienced an icy coldness and

saw the bones standing out on my hand. An icy chill ran down my back. I returned to the tree where my gun lay, released the safety catch and sat down in my former bivouac, waiting to see what else would happen. After about two hours the sky at last began to grey. A few hundred metres away the gamecock began his courtship, the actual reason for my early visit. I didn't move from my position, watching how this uncanny glow slowly extinguished, and suddenly the whole specter was over.

When at last daylight came, I returned again to the source of the flame and on every tip of the lush green leaves I saw oversize dewdrops, again in egg-shaped form, standing motionless like glittering candle flames. As the first rays of the Sun pierced the tangle of leaves, the grass-tips bent under the weight of the ur-water, which visibly grew as the Sun's heat increased.⁹ One by one, the now finished dewdrops fell down.

Now I began to dig into the hillock with the tip of my mountain staff and underneath a peculiarly smelling layer of humus, I felt a resistance, which after further digging, turned out to be the almost undecomposed corpse of a chamois buck, which had a clearly distinguishable bullet entry hole above the left foreleg. There was, however, no exit hole. According to the time of year, it could have been shot only by poachers, since the hunting season was long past. It was only later that it became clear to me that the buck must already have lain underneath this mound for a longish period, because it was covered by a thick layer of humus upon which vegetation had apparently sprouted. On even closer inspection, I found a sort of mass grave before me.

The old hunters used to insist that chamois (as also happens with elephants) seek out special places to die where slow decomposition rather than putrefaction takes place. Sick wild animals are attracted to such places which remain equally warm or cold in winter and in summer, seeking either a cure or a painless death. Expressed scientifically, constant anomaly states prevail, which permit decay-free decomposition. This is why, as a particularly sly old forester explained, the high clergymen had themselves buried in a constantly cool church crypt, or why the more common

priests at least had a little roof built over their graves along the cemetery wall at the eastern side in order to protect them from rainwater. I realized later that, because of its free oxygen content, which activates decomposive forces, rainwater actually promotes decay or rusting.¹⁰

Fertilizing energies

Schauberger's buried fermentation chamber is sited so as to be a meeting place for the male seminal energies of the Sun (acting perpendicularly to the Earth) and the female fertilizing energies of the Earth (acting horizontally at or near the Earth surface). The residues or fallout of their combination result in physical growth. As Schauburger describes:

Having been created out of the most thoroughly rotted elements of former life, these emanations are the most natural fertilizers, which have metamorphosed their erstwhile spatiality (spatial volume) to such a degree, that they can only manifest themselves as highly dosed (concentrated) energetic matter.¹¹

This is what sustainability is all about. Matter being the energetic waste products of higher (fourth or fifth dimensional) energies created through heat and light, their reconversion into energies make them the best possible natural fertilizers. There is virtually no limit to the charge that can be built up with these energies, as they are nonspatial.

The fertilizing energies (which may be a combination of dynagens, fructigens and qualigens) enter the plant itself through the root protoplasts, the little sacs or vesicles of proto-water or amniotic fluid attached to the root-tip. Like dew, another form of proto-water formed on the tips of blades of grass during the night and early morning, these vesicles, too, collapse if exposed to light and heat. This is why the greatest care must be taken when replanting small seedlings or saplings, which should be done only at night in order to keep injury to a minimum.

Absolutely essential to the plant, these delicate root protoplasts convert the nutritive energies and the minerals into a form that it can absorb. Viktor Schauburger's sketch (Fig. 17.4) illustrates the process, which he describes:

HIDDEN NATURE

No plant is actually nourished by dissolved matter, but rather by the nutritive entities of geospheric origin, 'ascended' in a fourth dimensional state. These diffuse ethericities can enter the sap-stream only through the root protoplasms, where they are fertilized by diffuse oxygenic ethericities. The higher out-birth of this emulsion (ur-procreation) is an ethericity that belongs to fifth dimension. These concentrations of matter-energy emit negative, hyper-charged emanations in all directions and bind the positively-charged ethericities entering through the skin or the bark. Some of this emulsion solidifies and whatever is subsequently manifested, is what we call 'growth'.¹²

With these natural methods of fertilization there is therefore much that we can do to promote healthy and sustainable growth in agriculture. With this technology we have the ability to restore the soil, our only source of wholesome food, to its former state of high productivity and fertility, and even to increase it. These means are not only far cheaper than the use of harmful artificial fertilizers and noxious pesticides, but they increase both the quantity and quality of food. Schauberger held that conversion of agricultural practice to sustainable organic fertility, forestry to biodiversity and water resources management to take into account Nature's more subtle processes, would halt the present deterioration both of the environment and of the human condition.

First we have to understand how Nature works, and accept her laws. Schauberger's life was devoted to this challenge. Let us hope that his work will empower people to seek this goal, and to encourage the changes needed to change our materialistically oriented society. In Schauberger's own words:

A free people can grow only from a free Earth. Any people that violate Mother-Earth have no right to a homeland, because high-quality races cannot survive in soils destroyed by speculation, i.e. because they are divorced of all connection with the Earth. Human societies without roots perish. They have to experience the path of decay until, like unsuitable fertilizers, they give up their stubborn wills and only then will they be allowed to start again and re-enter the mighty course of evolution.¹³

17. ORGANIC CULTIVATION

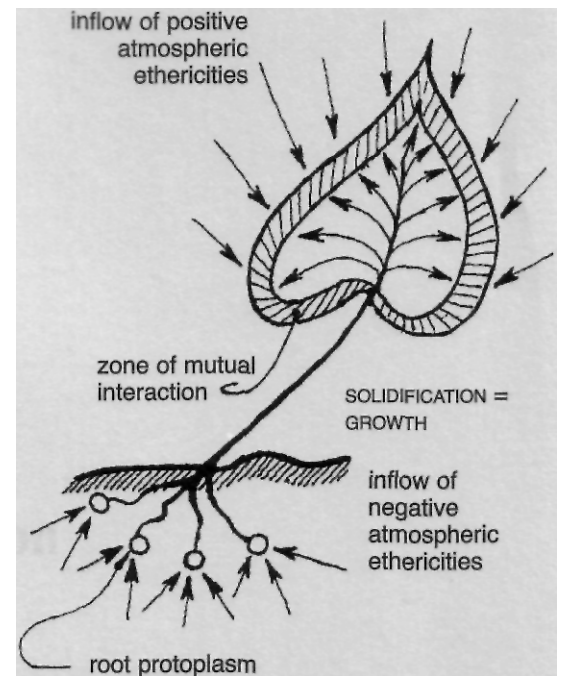


Fig. 17.4. Viktor's energy exchange diagram.

PART SIX



The Energy Revolution

18. Harnessing Implosion Power

'In the whole machine there is no straight line and no circle.'
(Viktor Schauberger's comment to a visitor to his workshop in 1936.)

Arthur C. Clarke, the futurologist, recently commented that we were on the verge of a breakthrough in how we access energy. This was before the giant aerospace company Boeing of Seattle announced new research with a practical anti-gravity device developed by the Russian scientist Evgeny Podkletnov.

The obvious area that would be affected is transport; space travel would suddenly become easy. Aircraft could carry us swiftly and silently without polluting the atmosphere. Surface transport could become swift and cheap. Building methods could be transformed; it could even help with advances in medicine.

But the principal gain would be virtually free, unpolluting energy, which could be produced even in our own homes. Gone would be the necessity to be dependent on an expensive national grid. These changes might not happen smoothly, because political and economic power revolves around the carbon industry, principally oil, and the utilities. Are these power brokers going to give up their control without a fight? Additionally our present, morally bankrupt societies seem always to give the military industries first choice of employing new technologies.

Because Podkletnov's invention was inspired by Viktor Schauberger's research, it might be interesting to follow how his discovery of anti-gravity came from devices he had developed through observing Nature.

The beginnings of implosion research

During the 1920s, Viktor Schauberger had made a bit of money (as well as a reputation) by building his revolutionary log flumes. This enabled him to design a prototype power plant to extract energy directly from air and water, based on the powerful energies he had identified in Nature. The first experiments he undertook with a Viennese engineer, Dr Winter, in 1931-32 were inconclusive, and

made him realize he had to undertake much more precise observations of how the trout actually transmutes the energies of the stream into such powerful forward motion.

The principle of the trout turbine was that air and water should be directed through spiral shaped pipes with a specially shaped cross section that moved the substance in such a way as to transform it into a 'living' state. After a certain number of revolutions the air or water would be induced through a specific corkscrew motion into a highly energized state, from which the energy could be released. What Schauberger was producing was a reaction at the atomic level. However, instead of violently compressing atoms in hydrogen gas to create helium and an energy release, he was able to twist all the elements together in the quiet, but powerful, way that happens in Nature; this was more comparable to atomic 'fusion.'

As we have seen, one of Viktor's brilliant insights into Nature's methods was the concept of reciprocity. Many of Nature's processes depend on the alternating of complementary, but opposite, forms of energy, e.g. heat and cold, gravity and levitation, electricity and magnetism, centrifugence and centripetence, both aspects of which combine to create a wholeness through their synthesizing, reciprocal action. Thus he found that alternating pressure and suction could be employed in this way on the axis of the machine to produce a powerful propulsive effect.

This 'biotechnical' fusion created what Schauberger called 'diamagnetic' or higher quality substances which had levitational tendencies that were the principal feature of the machines he designed at the beginning of the war. The first, built by a Berlin company in 1940, disappointed him because of the poor workmanship. So he moved assembly closer to home, to a Viennese plant where, in an unscheduled test, his first flying saucer-shaped prototype broke away from its anchoring bolts and smashed a hole in the factory's ceiling. The infuriated owner never forgave Schauberger and was uncooperative about testing a second model.

The German culture has a reputation for being open to new ideas. Indeed, a German industrialist who had heard about Schauberger's strange inventions recommended him to Hitler in 1934. Viktor made a strong impression on the Fuhrer who, after the interview, requested all assistance be given to his research in fuel-less energy production. The scientific establishment resented this upstart; indeed, the father of quantum physics, Max Planck, who

had been present at the interview, when asked his opinion of Schauberger's theories, retorted: 'Science has nothing to do with Nature.'

Professor Ernst Heinkel, who developed the innovative aircraft that bore his name, also heard about Schauberger's revolutionary power source, and stealing his confidential patent application, attempted in 1938 to incorporate it into his new jet aircraft, the under-performing HE 280. Heinkel persuaded the patents office to restrict Schauberger's technology to water purification projects, so that he would be free to develop Schauberger's innovations in his aircraft research. However, it dawned on him that the conventional aircraft frame was totally inappropriate for Schauberger's suction engine. The development in 1940 of Schreiver's 'Flying Top' in Heinkel's Rostock factory suggests that he had more success when the power generator was transferred to the new model of prototype flying saucer.

In 1943, the Schreiver saucer and its subsequent developments were moved to a secret location in Czechoslovakia to which Schauberger was from time to time seconded. Word of this new 'aircraft' reached Himmler's ears; he was drawn more to unconventional science as a source of new weapons development. Viktor's activities were at that time highly secret, moving from one project to another, but he was apparently not at that time given responsibility for research and development. However, in 1943 Himmler entrusted to the SS the role for developing German secret weapons.

The SS established production facilities for these new secret weapons in giant cave complexes in Poland and Czechoslovakia, safe from Allied bombs, using prisoners of war as labour. Had these underground facilities been set up earlier in the war, its outcome might have been different. The level of secrecy was extremely high; so much, indeed, that at one crucial location at the end of the war, the SS lined up 62 of the scientists and laboratory technicians, and shot them, to save the secrets of that complex 'free energy' atomic installation falling into the hands of the approaching Soviet troops.¹

The SS decided in 1944 that Schauberger's machines were ready for production. They drafted him and ordered him, under pain of death, to employ prisoner engineers from the Mauthausen concentration camp near Linz to develop five projects. In addition to the high priority flying saucer programme, there was a water purifier, a high voltage generator, an air conditioner and a machine to

biosynthesize hydrogen from water. However, because of the success of the Allies' bombing, Schauburger moved his operations to Leonstein in Upper Austria, and the improved Repulsine was finally ready for testing the day the Americans arrived; the SS guards had disappeared the day before.

A British engineer, John Frost, who emigrated to Canada shortly after the war, developed a flying saucer project called the Avrocar at a Canadian aerospace plant, funded largely by US capital. It was to take off and land vertically, and to fly at high altitudes at 1,500 mph. They were having trouble with its stability and, realizing that the power plant was inadequate, approached Viktor Schauburger with a generous offer to buy his propulsion system. Viktor declined, because they refused to promise that his invention would be used only for the good of humanity. Schauburger reported that he had a second offer of \$3.5 million from an American company, which he refused for the same reason. This was not long before the Gerchsheimer consortium contacted him.

The American consortium

Karl Gerchsheimer, initiator of the American consortium that tried (see p. 13) to extract Schauburger's secrets in 1958, as head of all civilian administration and logistics had been the most powerful non-military presence in the U.S. zone of Germany from 1945 to 1950. He was a Bavarian who thought he understood where Schauburger was coming from — he had read some of Viktor's papers, and felt he shared the same love of the mountains and their pure water.

Gerchsheimer formulated a plan with industrialist and financier Robert Donner to bring Viktor and his son to the U.S. to help develop radical power technology, although by that time Schauburger was in very poor health. In May 1958 the group assembled in a secret hideaway in the Texas desert. There were many delays and serious communication problems. Gerchsheimer and Donner had a disagreement with Donner's financial adviser, Norman Dodd, their production director, whom they fired in contentious circumstances. Viktor eventually became convinced, probably mistakenly, that the consortium was part of a U.S. government plan to make a very powerful atomic bomb by developing his research trail, and refused to cooperate.

Basically, they had different agendas; the Schaubergers, Gerchsheimer and Dodd all gave varying accounts of what actually happened. Gerchsheimer complained that Viktor's explanations of his theories were unintelligible and suspected that they were flawed. He gradually came to the conclusion that Viktor would not be able to deliver what they wanted. Viktor, for his part, rebelled when it was finally made clear that he must stay for eight years, whereupon he effectively refused to engage in any further communication.

Only after he and his son had agreed to sign a new contract (which was not translated into German for them), effectively consigning to the consortium all rights to his documents, designs and models and to any future ideas and inventions, was Viktor allowed to return to his beloved Austria, a broken man.

A new kind of aircraft?

The Wright Brothers' plane a century ago had wings, a tail fin and rudders. All our commercial jet aircraft today are built on the same principles, but are far less fuel efficient, requiring hundreds of times the energy to push through the atmosphere. More and more power is expended to counter both the air resistance and the pull of gravity, at quite astronomical costs in terms of materials and development. It was to reduce the force of gravity that some of the large aerospace companies in the U.S.A. were undertaking research in the early 1950s. One researcher, Townsend T. Brown had designed a saucer-shaped craft whose weight was significantly reduced by energizing the skins with massive amounts of electricity and which happened also to make the craft invisible to radar.

Conventional scientific theory states that certain laws are inviolable, like the Second Law of Thermodynamics, Einstein's Theory of Relativity or the Law of Gravity. We learn this at school, and anyone who claims otherwise is treated with suspicion or derision. Researchers now working at the frontiers of science, such as in quantum physics, are discovering that these laws apply only under conventional physical conditions, though this is not yet widely accepted.

The discovery that the force of gravity can be reduced or even cancelled has profound implications for humanity. It is as though we can add another dimension to our world, one that had always been present, though not in our awareness. For many people

(especially conventional scientists who like events to be predictable) this may be a scary and unwelcome development.

The appeal of anti-gravity is powerful. Passengers travelling in a plane that was able to cancel out gravity would not experience any discomfort, no matter how fast it accelerated or changed course. It would revolutionize space exploration. Put to work in other fields, the absence of gravity would solve the problems of power transmission from engine to wheels, would facilitate fuel-less heating for homes and industry, and have many other uses, even in medicine. Predictions were being made in 1956 that a new kind of aircraft using anti-gravity would be developed within five years. All that was required to usher in an era of efficient, economical, clean and quiet, fuel-less propulsion, of free energy technology for industry and the home — was investment and a little encouragement from the U.S. government.

It never happened; or did it? All discussion about anti-gravity ceased in the U.S. in 1957. But that was the time when the research and development arm of the military-industrial complex went underground, or 'black' as the popular idiom has it, becoming completely unaccountable to government, with astronomical procurement budgets carefully hidden from the scrutiny of the legislative branch. This was justified for reasons of national security during the Cold War, and so it has remained ever since. In fact, America was following the example of Nazi Germany, where the initiative for developing new weapons was taken from the armaments industry in 1943 and entrusted to a very secret (mostly literally underground) programme run by the SS.

There have been various reports of secret aircraft being developed by the black side of the U.S. aeronautical industry. The most noteworthy was the triangular-shaped Northrop B-2 Stealth Bomber which has an electrogravic drive system; it had followed the Lockheed Stealth Fighter (the term 'stealth' signifying their invisibility to radar). Some believe that the B-2 has a system to reduce gravity; what is more accepted is that it envelops itself in a shield of static electricity which both acts like a cloaking device and reduces its air resistance. Since the B-2 went operational in 1993, twenty have been built at a cost of \$20 billion each.²

It has been suggested that test flights of experimental flying saucer aircraft may account for UFO sightings. While this is certainly possible, evidence is still lacking of the significant development of a

successful U.S. saucer programme. The evidence, however, for visitations by craft from extraterrestrial sources, and for the US government's undercover research with recovered alien craft is rather more tangible, despite continuing and complex official denials and disinformation campaigns.³

Nick Cook, in his book *The Hunt for Zero Point*, comes to the conclusion that the giant aerospace industry is essentially conservative. They could not take on the kind of anti-gravity research pioneered by T.T. Brown in the late 1940s because they would have lost their credibility within the science of aeronautics, and the industry would have suffered.

What I have learned is that there are two kinds of science. The stuff they teach you in college, and all the weird things they don't. This knowledge is dangerous. It's change with a capital C and it's not easy to get your head around. The aerospace and defense industry says it likes people who think out of the box, because they're the guys who give us the breakthroughs ... radar, the bomb, stealth and all that; but think this far out and they look at you like you're crazy. They might even put you away.⁴

The other, often overlooked, reason for conservatism in technology is the extent to which political and economic power is centred partly in transportation, but especially in the carbon fuel industry. As long as there is plenty of oil to be pumped, why risk destabilization of this power by investigating virtually free energy sources that would inevitably bring with it much more freedom for countless millions of people who are currently dependent on the expensive central distribution of oil products and electricity?

Schauberger's search for free energy

However, in July 2002 Jane's Defence Weekly announced that they had seen secret research papers from Boeing, the aerospace giants, confirming positive development of a Russian device — which comprises rapidly spinning superconducting ceramic discs suspended in the magnetic field of three electric coils enclosed in a low temperature vessel.

The man behind this research is Dr Evgeny Podkletnov, a Russian scientist then working in Finland. When he first published details of his anti-gravity device in 1996, he was ostracized by his colleagues and then fired by his university, for the Law of Gravity is inviolable! He subsequently admitted that his father, a leading authority in hydro-engineering, had acquired original Schauburger papers at the end of the war.

The most creative pioneers of new scientific vision are essentially practical people who have an urgent need to see their ideas put into practice. Viktor Schauburger was no exception. Realizing that the machines our technology has developed are not only very inefficient, but that they are also largely responsible for the destruction of our environment, he set about designing appliances which used Nature's creative methods, but which were capable also of producing vastly more power at little cost.

Schauburger abandoned the Euclidean model of straight line and circle. All the functional surfaces of his machines employ the spirals, sinuosity and curves of the open forms of non-Euclidean geometry that are found in Nature. The egg-shapes and spirals that he employed produced life-affirming energies that stabilize, enhance and rehabilitate natural processes.

When Schauburger designed his prototype machines it was extremely difficult to perfect complex curvilinear surfaces. Now, with computer programmes, it is possible with ease to replicate Nature's eggs, spirals and vortices. A design breakthrough to designing benevolent systems would be theoretically simple; what is lacking is the insight and the imagination.

During the 1930s and 1940s, he developed a number of prototypes: of a machine which produced high quality spring water, a domestic air conditioning appliance, and various machines which produced prodigious amounts of motive power. All these machines worked on much the same principles, and had in common a virtually silent and inexpensive operation. All the important elements of Nature's repertoire come into their own, such as male and female ethericities, creative vortical movement, temperature gradients, bioelectricism and biomagnetism. As Schauburger commented: At the intersection of two temperature gradients atomic energy is released. Whether it is a formative or destructive energy is determined in each case by the type of movement and the composition of the alloys used to build the motion-producing machine.¹⁵

The biological vacuum

I can generate suctional forces which act indirectly and are entirely undetectable. No current of air can be noticed; only an almost imperceptible cooling, as occurs when air is sucked in strongly with the back of the hand held in front of the mouth. It is therefore incorrect to say that I have copied the cyclones and typhoons of the tropics.⁶

The mechanical principle of all of Schauberger's machines is that of suction, the simplest form of which we experience when we place our hand over the plug hole in a bath of deep water; taking it away and replacing it illustrates the enormous power of suction. Professor Felix Ehrenhaft, who helped Viktor with his calculations, worked out that the power of suction, or implosion as it is called in energy terms, is 127 times more powerful than explosion.

Bathtub suction is powered by gravity, which is related to centrifugence, the complement to centripetence. In a similar way that the aircraft jet engine uses the interaction of suction and pressure on a common axis, Schauberger used the balance between centrifugence and centripetence on a common axis to produce a biological vacuum.

This is created by spinning the gas or liquid at high speed in a vortical manner so that it becomes dense and cool. If water were used, every 1°C of cooling would reduce the volume of the gases contained in the water by 1/273. However, if air containing an average amount of water vapour is used, the amount of compaction of air to water is in the ratio of 816 to 1. One litre of water at +4°C (39°F) weighs 1kg, compared to one litre of normal air which weighs 0.001226kg. This is the basis of implosion energy.

In 1939 the American airship the Akron was destroyed when its helium mysteriously reverted to water, reducing in volume 1800-fold in a massive implosion. This immense reduction in volume creates a biological vacuum that can be an ideal and environmentally harmless source of motive power. Gases are converted into water and those contained in the water are further transformed into energy in the process of continuous cooling which occurs in the formation of a biological vacuum.

Viktor's machines, besides spatially reducing physical matter, also converted it into immaterial energies, in reality a translation from the third to the fourth or fifth dimensions. Callum Coats writes:

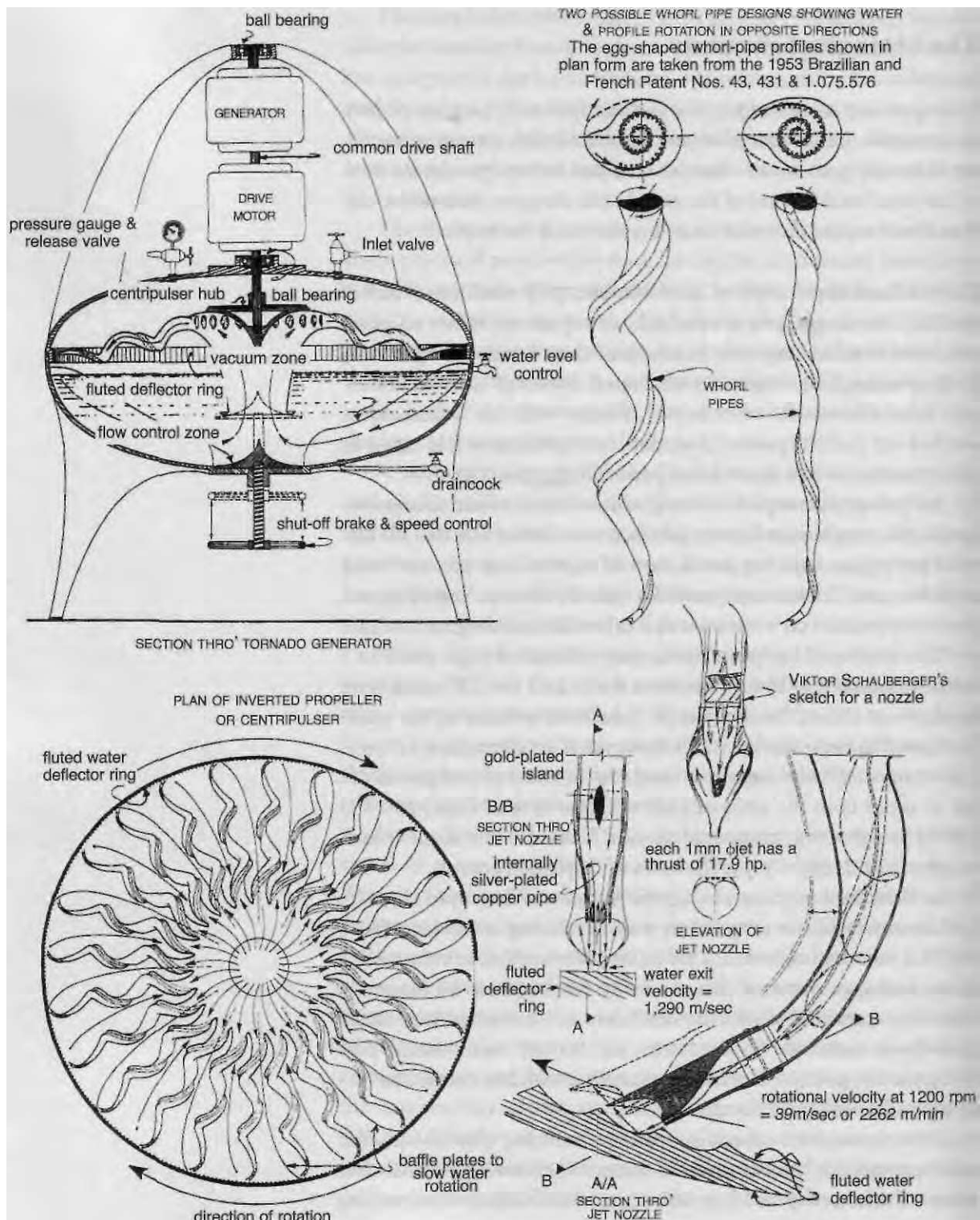


Fig. 18.1. Tornado home power generator. Schematic design based on patent applications and other data.

This higher realm of being is what Theosophical teaching refers to as the Taya point,' the point of extreme potency, the eye of the needle as it were, through which and from which all manifesting energies are propagated. Viktor called this process a 'higher inward fall,' noting in his diary of August 14, 1936:

I stand face to face with the apparent 'void,' the compression of dematerialization that we are wont to call a 'vacuum.' I can now see that we are able to create anything we wish for ourselves out of this 'nothing.' The agent is water, the blood of the Earth and the most universal organism.⁷

Viktor Schauburger demonstrated how to remove matter from the physical dimension, and to pack the resulting nonspatial other-worldly vacuum with almost unlimited amounts of pure, formative energy, the counterpart to the physical substance that had been transformed. Simply the appropriate trigger, usually light or heat, could unleash this huge potential and source of power.⁸ He described his aim as follows:

I must furnish those who would protect or save life with an energy source which produces energy so cheaply that nuclear fission will not only be economical, but ridiculous. This is the task I have set myself in what little time I have left.⁹

Nuclear fusion

The dichotomy between centrifugal and centripetal technologies is never clearer than with nuclear energy. Viktor frequently inveighed against the dangers of nuclear fission (explosive), and he came near to the unveiling the secrets of nuclear fusion (implosive), the Shangri-la of our technical age. The key to it was the extreme biological vacuum, achieved most nearly in his 'flying saucer,' described later. The process can be described as 'cold fusion.'

Walter Schauburger, with his physics and mathematical background was able to describe the process of conversion of matter into 'virtual' states in a way that other scientists could understand; in this way the approaches of father and son complemented each other. Richard St Barbe Baker, the prominent environmentalist and founder of 'The Men of the Trees' movement, impressed with the

potential of the Schauburger physics tried, sadly without success, to interest Clement Atlee's UK government in supporting Walter and Viktor's implosion research.

Instead, Baker brought Walter to England in 1950 to lecture to and dialogue with top scientists. First, at Oxford, there was a gathering of physicists, chemists and forestry researchers, who affected polite interest, but refrained from comment. However, at Cambridge Sir James Chadwick, who with Rutherford had first split the atom, was most impressed with Walter, introducing him to other atomic physicists.

A group of top atomic physicists at Birmingham showed lively interest in this new physics, and admitted to being inspired. A few weeks later Baker was again in Birmingham, and asked the scientists if they had held a postmortem on Schauburger's presentation. 'Yes, indeed,' they admitted; they had decided that it was 'unchallengeable.' 'Then what are you going to do about it?' asked Baker. 'Nothing,' was their retort. 'Why not?' 'Because it would mean rewriting all the textbooks in the world.'¹⁰

The repulsator

Viktor started work on this machine (Fig. 18.2) early in the 1930s. It was designed to convert degenerated or distilled water into invigorating fresh water with the qualities of a mountain spring. A 10-litre egg-shaped vessel made of copper, with some active surfaces silver-plated, was used, insulated to retain the biomagnetic and bio-electrical energies. A powered impeller near the pointed base created alternating right and left handed vortices in the water body, duplicating the negatively and positively charged longitudinal vortices at the bends of naturally flowing rivers. It was inevitable that for his energy-generating machines Viktor Schauburger would choose the egg as it is the only closed shape that will naturally generate vortical movement.

The in-rolling and out-rolling movement allows the water to absorb carbon dioxide and various trace elements that are added in a specific order to approximate the chemical composition of mountain spring water. Some four litres of water are drained off while carbon dioxide is introduced. Once the motor has been started, the carbon dioxide is absorbed into the water. Through the vortical action and resultant cooling, it is changed into carbonic acid, which

creates a vacuum. When the water has cooled down to 4°C (39°F), cold oxidation takes place, allowing the assimilation of the trace elements and minerals.

The process takes three-quarters of an hour, and the water is then left to stand in a cold temperature for 24 hours. The water, when sipped slowly straight from the egg at a temperature of not more than 8°C (46°F) will neutralize any over-acidity in the body, allowing the cells, by taking up oxygen (which is passive at this temperature), to return to health.

The implosion motor

This ambitious machine was designed as an electric power generator, though it did also produce high quality water. It worked on the same principle as the Repulsator, being first filled to exclude air and then drained sufficiently to allow the simultaneous introduction of carbon dioxide.

It was difficult to build, being dependent on a series of identical whorl pipe water jets conceived to replicate the shape of a Kudu antelope horn. This intriguingly shaped tube, which has an egg-shaped cross section, allows an almost perfect hyperbolic double spiral flow to manifest. The shape of the pipe and reducing diameter follow the proportions of the Golden section (see p. 69).

This configuration operates in the same way as Viktor's pipe in the Stuttgart experiment, where the shape of the pipe directed the water in an involuting flow away from the pipe walls, significantly reducing the friction. In the two forms of whorl-pipe shown in the diagram (see Fig. 18.1), the water rotates either in the same direction as the spiral twist of the pipe, or in the opposite direction, depending on which whorl-pipe is selected, the hydraulic efficiency of either being determined by experiment. In practice only one or other of the whorl-pipe configurations would be attached to the central hub.

This centrifugal/centripetal effect creates a double spiral motion to the water, cooling and condensing it; it also allows the energies to change polarities, eg from magnetic to bioelectric or from electric to biomagnetic. This change of polarities would convert resistance-producing energies into motion-enhancing ones, such as levitational and diamagnetic dynagens.

When the centripulser is rotated by the motor at 1200 revolutions per minute, the water is centrifuged down the whorl pipes while

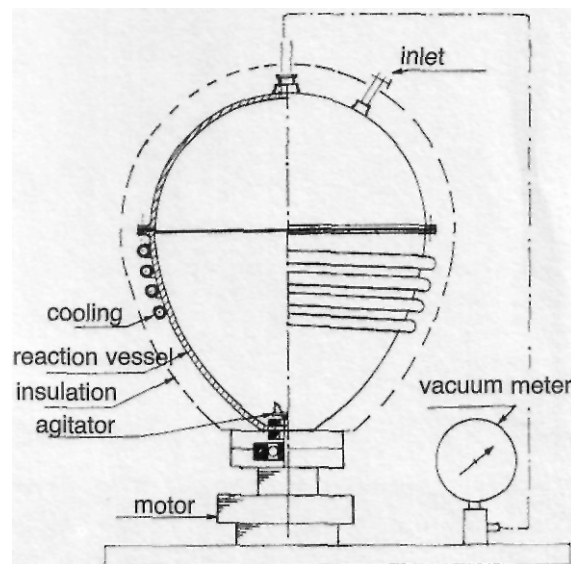
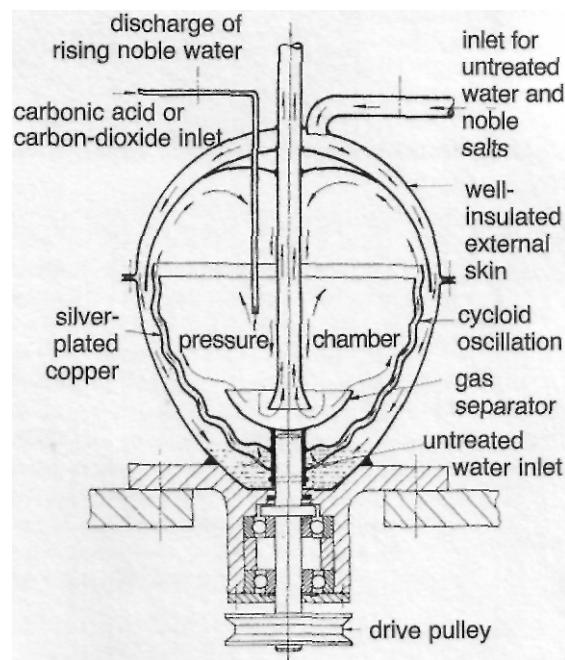


Fig. 18.2. The repulsator. For the biological synthesis of spring water:
(a) Alexandersson's (above)
(b) Schauburger's (below)



undergoing a double spiral centripetal contraction. It leaves the 1mm diameter nozzle (there are 4 per pipe) with tremendous force because of its density and high velocity. The exit velocity of the water is about 1,290m/sec, (four times the speed of sound), which makes it as solid and hard as steel wire.

The following is the eye-witness report of Gretl Schneider, who accompanied Arnold Hohl, one of Viktor's observers:

Mr Viktor Schauburger has demonstrated the machine to me. The previous huge construction is no more. It has been reduced to half its former size and in operation develops enormous power. I poured a pot of water into the bottom of it. The machine produced an almost inaudible sound and then a 'pfff' in the same instant and the water pierced right through a 4cm thick concrete slab and a 4mm thick super-hardened steel plate with such force that the water-particles, invisible to the eye due to their high velocity, penetrated right through all clothing and were experienced as lightning needle-pricks on the skin. Water glass was also passed through and solidified in 5cm long hairs on the outside of the casing, like bristles.¹¹

Some of Viktor's machines did not need a starting motor, and would get going on their own with a few cranks of a manual starting handle. The heavy centripulser perhaps required one, but after gaining sufficient speed would produce sufficient energy to self-rotate. If the machine works as Viktor claimed, the generator should produce ten times more power than the motor needs, or a ninefold surplus of electric current. One of the problems with Viktor's machines was more how to stop them than getting them started. Another was keeping the machine anchored to the floor to stop the strong levitational energies that were generated from lifting it into the air.

The repulsine and the flying saucer

As we described in Chapter 1, there were several models of this machine developed, the first in 1940 to investigate free energy production, later to validate Viktor's theories about levitational flight, but in the mid-1940s as prototypes of a new secret weapon of the Third Reich:

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There are many rumours about what Schauberger was actually doing during this period, most of which suggest that he was in charge of developing 'flying discs' under contract to the army. It later became known that 'the 'flying disc' launched in Prague on the 19th of February 1945, which rose to an altitude of 15,000 metres in three minutes and attained a forward speed of 2,200 kph, was a development of the prototype he built at Mauthausen concentration camp. Schauberger wrote, 'I first heard of this event only after the war through one of the technicians who had worked with me.' In a letter to a friend, dated the 2nd August 1956, Schauberger commented, 'The machine was said to have been destroyed just before the end of the war on [Field Marshal] Keitel's orders.'¹²

This was a much larger version of a 20cm diameter one that Viktor built at the Schloss Schonbrunn which was called the Repulsine. It contained a small high speed electric motor capable of producing up to 20,000rpm at which point the auto-rotation of the centripulser was initiated. 'This machine generated such a powerful levitational force, that when it was started (in Viktor's absence), it sheared the six quarter-inch diameter high-tensile steel anchor bolts and shot upwards to smash against the roof of the hangar.'¹³

There were in fact two different types of the Repulsine. One was secured to the ground and designed to produce power by means of a horizontal shaft; the other to fly. Both produced strong levitational energy — hence the second anecdote above.

As the velocities produced by the centripulsing process increase, the air molecules become cooler and more condensed through the interaction of both centripetal and centrifugal forces. The reduction in volume may reach 1/816, when air is converted into water, and produces a powerful vacuum inside that rapidly draws in larger amounts of air, creating a secondary vacuum above the saucer. The extreme centripulsion and densation not only produce an antigravity effect, but also raise the energy level beyond the physical, so that the electrons and protons are compressed back into their fourth dimension origins.

All of these actions contribute to the levitational affect, enhancing the principal upwards force provided by the densely compressed atoms passing through the aerofoil slits of the turbine blades ('t') before being thrust out between the outer cowl ('A') and

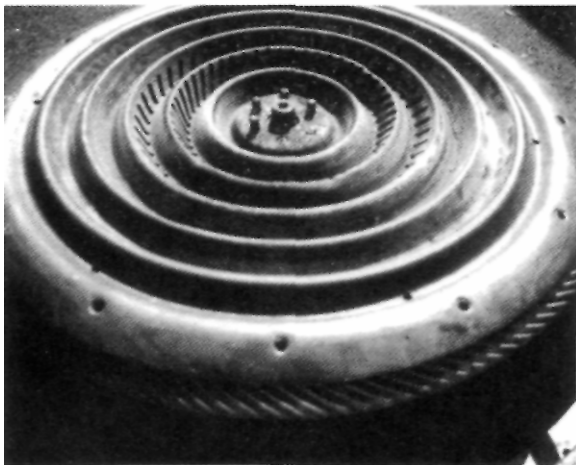


Fig. 18.3 & 4. Repulsator prototypes.

the inner cowl ('E') with explosive force, hurling the saucer into the semi-vacuum above it (see Fig. 18.5, opposite).

Callum Coats in his fourth volume of the Eco-Technology series, *Energy Evolution*, brings together Viktor Schaubergers notes, comments and discussions that have survived the appropriation of the Soviet and American authorities. In that fascinating volume the machines discussed are the Air-turbine machine, Water-driven and Air-driven implosion machines, the Repulsator, the Klimator and the Repulsine. Sadly, the text often refers to sketches that are missing.

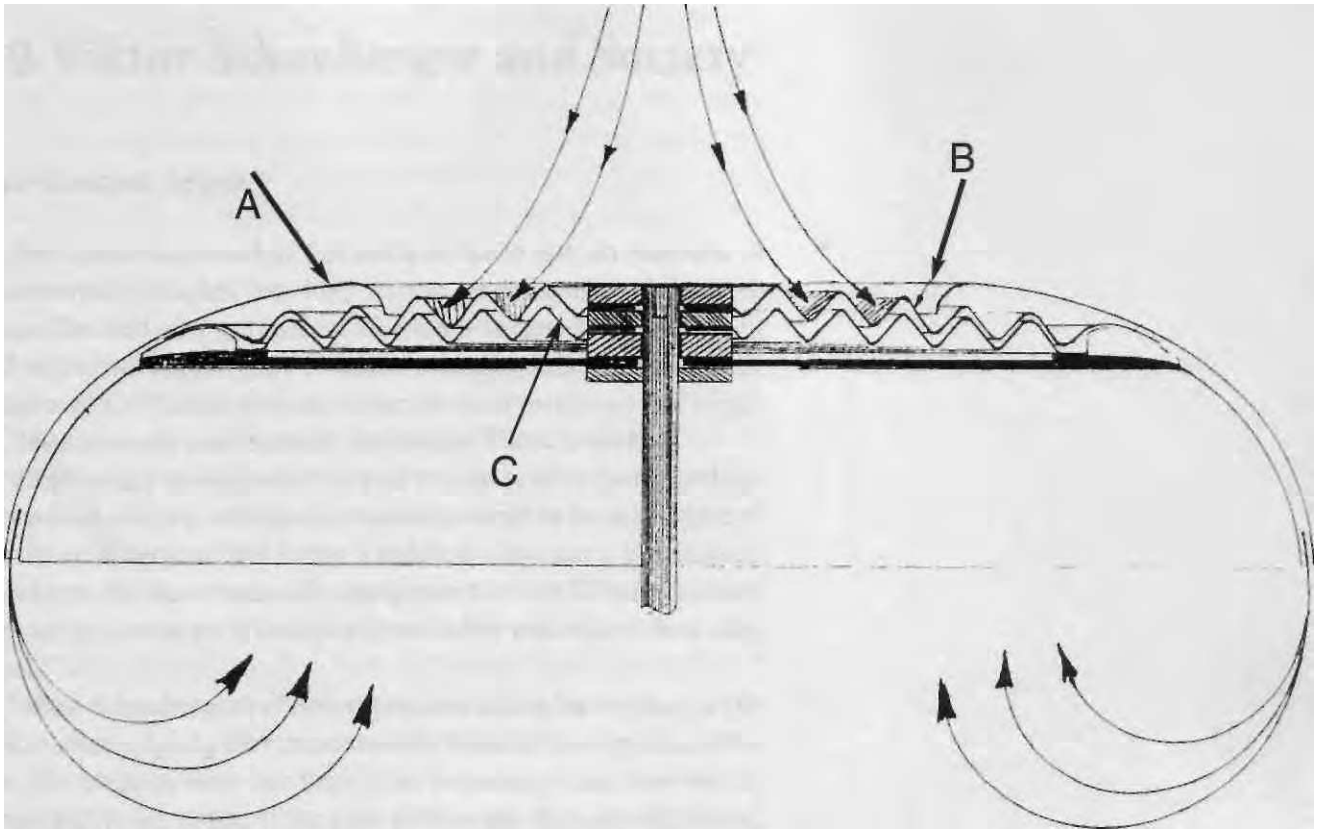
The Air-turbine machine created an artificial thunderstorm, operating on the principle of the tornado. Schaubergers envisaged this as a fuel-less silent engine to power an aircraft by creating a vacuum in front to pull it forward. The Water and Air-driven implosion machines operated on the principle of a powerful vacuum; he designed a submarine using a water-driven implosion motor. The Klimator was a cooling or heating machine designed for domestic air conditioning.

There is no doubt that Viktor Schaubergers produced a number of impressive and highly innovative machines for various purposes, and we have eye witness accounts of the operation of some, as well as some of his notes. However, any prototypes or working models were either destroyed in Germany during the war, or were expropriated from his flat by the Russians who first occupied Vienna, or confiscated by the Americans when they overran the Leonstein works at war's end, or by the Donner-Gerchsheimer consortium, who spirited him away to Texas in their ill-fated attempt to acquire his secret knowledge.

In the meantime it must be noted that there is no proof that any of them reliably produced over a significant period the power that was intended.

There are a number of people in America and Australia working on Schaubergers ideas, though the political climate has repressed development of their work. Let us hope that if these conditions improve, we might see modifications of some of Viktor's machines making their appearance. We shall be examining in the next chapter some of the new initiatives that have been inspired by Viktor's research.

The tragedy of Viktor Schaubergers life was of being born into a society with little interest in his dream of helping humanity become empowered and free. Instead, to his intense sadness and heartache



he found his inspired vision of working with Nature twisted towards the military aims of one of the most sadistic regimes of modern times.

American science could not take seriously someone with no education in science. Viktor Schauberger was hardly one to be considered as a contender for the stakes of space-age innovation. He merely observed Nature and talked about fish swimming in mountain streams, yet he was the one who cracked the anti-gravity challenge. As he himself remarked:

Implosion is no invention in the conventional sense, but rather the renaissance of ancient knowledge, lost over the course of time.¹⁵

Fig. 18.5. Cross section through flying saucer.

A — 1.2mm thick curved copper sheet, with central opening seen on Fig. 18.3. Between rilled plates B & C, air is drawn in due to the centripulser's high rate of rotation and subjected to powerful centrifugal and oscillating forces which cool and condense it. Transforming into water condenses air 816 times, causing a vacuum which accelerates the intake of more air. At revolutions of 20,000 rpm, vacuum and densification become intense, packing the molecules so tightly as to cause a levitational effect. The living vacuum thus created changes the atoms into a virtual state, compressing them back into their original 4th dimensional formlessness.

19. Viktor Schauberger and Society

The human legacy

We have been concerned in this study so far to give an overview of Schauberger's insights into how Nature works at the subtle level. Viktor also had strong views on where our society has gone wrong and where we might start to make changes. First we shall seek insights on the human level and, later, we shall mention some ongoing developments and research inspired by Viktor's work.

Viktor was a natural scientist and visionary who challenged the very worldview of a culture that considers itself to be at the apex of human achievement. His is not a political view, nor a particularly moral one. He was continually exasperated by the literal blindness of those in power, their inability to see what was before their very eyes.¹

Viktor Schauberger's observations and vision have given us the keys to disentangling the environmental mess we have got ourselves into. His insights were not limited to technology and how we do things, but to all of life. If we were able to see that our education, social organization, philosophy, religions, medicine and science were all based on seeing only a part-world, we would have a sense of how much more exciting and fulfilling life could be on this wonderful planet, if we could escape from our materialistic worldview and accept our place on Nature's interconnected plane.

But, like the crowd in Hans Andersen's tale going along with the naked Emperor's fantasies, we are all accomplices in this tragic charade. Schauberger put it forcefully:

If humanity does not soon come to its senses, and realize that it has been misled and misinformed by its intellectual leaders, the prevailing laws of Nature (with poetic justice) will reliably act to bring about a fitting end to this ineptly contrived culture. Unfortunately, the most frightful catastrophes or scandalous disclosures will have to happen before people become aware that it is their own mistakes that have led to their undoing. These can be rectified only with great

difficulty, precisely because it was those in power principally who committed them. Rather than question themselves, these institutions and individuals, ever protective of their own interests, would allow millions of their fellow human beings to perish before they would ever admit their errors.

A host of so-called experts is lined up against any systematic attempt to correct these errors. They are obliged to advocate the course they have championed, because it is their livelihood and they wish to be looked after until the end of their days. Yet, even this obstacle might be overcome if the mistakes could be restricted at least to a particular branch of industry. A thorough analysis of the most common mistakes made over the centuries reveals the enormous extent of the malaise arising from flawed principles and perverse practices. It reveals such grave cultural, technological and economic violations that no branch of industry is left untouched. Not even a partially unaware expert can absolve himself of blame, whatever his chosen field.

At the outset a powerful opposition must be reckoned with. It would be futile to expect any support from experts when, under these circumstances, it is obvious that nearly every one of them would be threatened. But this obstacle should cause no alarm, for we are not concerned here with the livelihood of a few, but with the survival of the whole of hoodwinked humanity. The attitude of many of our young people today certainly provides clear evidence that humanity is still morally healthy. They militate vehemently against the signs of decay emerging everywhere and refuse to continue to trot mindlessly down the road... that has led us into an economic and cultural cul-de-sac.

Opposition alone, however, achieves nothing. Our youth will achieve any practical success in their struggle only when the causes are identified and the errors are revealed that previous generations and we have made, so plunging the world into disaster.²

Schauberger wrote often of how balance is one of Nature's most urgent requirements. He would comment on how humanity is contravening Nature's law of balance. Amongst these imbalances are the enormous inequalities in wealth and opportunity in almost

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every country on the globe; a totally unacceptable level of persecution, abuse and lack of human rights; the pursuit of mindless, hedonistic and materialistic activities; and above all a lack of compassion or respect for fellow human beings of whatever origin, and for the animal and plant kingdoms. These are not moral observations of humankind, but part of a detached view of why we are violating the health of Nature or the planetary biosphere.

In Chapter Two, you may remember, when we discussed how all material objects are composed of atoms and particles in constant motion, it becomes possible to understand that everything is energy. There are different kinds of energy; thoughts and feelings are energy. Energy has qualities as well as frequency. Energies and actions of differing qualities affect each other favourably or adversely. For example, the crucial ingredients of the human being's gift of free will are intention and commitment. The quality of the intention (self-important/greedy or loving/compassionate) affects the quality of all our actions and their outcomes. Healing of any kind or at any level is affected by the quality of the healer's energy. In one's experience this becomes quite clear, yet apparently it is beyond the ken of contemporary science. Viktor Schauberger was amazed that this basic knowledge was not part of our education.

Viktor was attuned to the wider field of knowledge, and felt that our educational system greatly contributes to our society's limited worldview. He did not specifically write about this topic, but the following quote from a recent study very much sums up what he felt, and helps us to understand where things have to change:

Our much-vaunted educational system specializes in instilling the known. There is a token and often grossly insufficient acknowledgment of the process of knowing. The knower is the Cinderella of almost every educational system. Self-awareness is actually obscured by conventional education, which cultivates a mentality of splitting, separating and compartmentalizing. Knowledge is gained of separate disciplines which are greatly divorced from the knower, isolated from each other and cut off from their connection to life lived in the world. As a result, by the time pupils leave school, if they are lucky their minds may have been fairly well-honed, but they are tuned to specialization and the particular, adept at putting things in boxes with labels, rather than being open to

the larger field of knowledge. Their energies may be well channeled, but they display only a fraction of the creative innocence and appetite for life and learning of a small child. (Ardui and Wrycza, *The Way of Unfolding*)³

What of the future?

Viktor Schauberger realized that the human community had little time to change its ways and begin to follow Nature's laws, before the inevitable reckoning that Nature will require of humanity. He had a rather touching faith in the ability of the younger generation to overthrow the oligarchies of power. However, in the last fifty years, the ability of a controlled media, especially television, to manipulate and undermine cultural behaviour, and the apparent irreversibility of the drug culture, have discouraged hope of initiatives coming from the young.⁴

The years since Schauberger's death have also seen the tentacles of multinational corporations reaching into every country in the world, capitalism at its worst. The capitalist system which has developed in the past 500 years or so, has brought unprecedented wealth to millions across the world. This increase in people's individual incomes (which admittedly expands their choices) has come at the appalling cost of pulling humanity as a whole out of balance with its environment; it is the enemy of biodiversity, and therefore of Nature. Until our human society has more interest in moral and ethical concerns than in making money, we are probably stuck with capitalism, for state ownership of industry has not always proved particularly workable.

The other structure with which we seem to be saddled is so-called democracy, which despite its name, has proved to be nearly as corrupt a way of centralizing power as any totalitarian system. If we wish to participate in society, we are committed to some extent to collude with these systems.

If more choices were made on moral and ethical grounds, rather than self-interest, the capitalist system might be doomed. However, if we can begin to see that the engine that drives Nature and its evolutionary processes has its origin in the supreme spiritual centre and source of all creativity (of which Nature is the mirror), then our moral principles would have a more stable foundation. Nature has no morality; but its laws seem to have been designed by the

supreme consciousness to harmonize with the moral and ethical standards set by 'God' for humanity (e.g. The Ten Commandments). The most relevant of Nature's laws for us are perhaps the laws of Balance, of Biodiversity, and of Evolution towards higher consciousness.

On present performance, it is doubtful whether the human community can remain viable into the twenty-second century; the seeds of our self-destruction have been sown so widely. I have always felt that it would take a worldwide disaster to bring about the collapse of our corrupt systems, which could return decision making to the place where it really belongs - the local community, in respectful relationship to its natural environment; which, we must accept, has happened in the past.

Dr Dorothy Rowe, the distinguished psychologist, said in a recent interview: 'Ninety-nine percent of suffering isn't caused by natural disasters; it's caused by the ideas we hold. And if we believe these ideas are absolute truths, then we suffer and we force other people to suffer. But if we believe that our ideas are ideas we have created, then we know we're free to change them.'⁵

Appendix

Implementing Schauberger's vision

It is clear that many are now responding to Viktor's call to become familiar with Nature's laws and to work with them. They are recognizing that this is the only way to start turning back from the terminal disasters that otherwise surely await humankind. As with any significant changes of consciousness in human history, a few pioneers become the leaven through which all of society starts to wake up and, like a cosmic shift, the awakening becomes unstoppable.

What follows are examples of what these pioneers are up to. For the most part these are very practical projects, often to do with water purification, river management or energy generation. What these innovations often have in common is the influence of the spiral or of vortex energy. The one area that is missing is that of implosive energy generation. Without Viktor's models and detailed drawings, it is hard to see how anyone can crack that nut, unless someone in American or Russian intelligence leaks some vital notes (as with Evgeny Podkletnov).

There is, however, the theory of spontaneous or synchronistic origination, which some claim accounted for the simultaneous discovery of electricity and other significant technical breakthroughs. When the time is right and the need is great, perhaps some higher intelligence with a concern for human evolution has cooperated through Nature to sow simultaneously the necessary seeds in a number of fertile minds.

Contact addresses and websites for individuals and groups mentioned here, and others, are found in Resources, on p. 276.

SWEDEN

Olof Alexandersson is a Swedish engineer who became interested in Viktor Schauberger's research in 1956 and wrote the excellent introductory book *Living Water: Viktor Schauberger and the Secrets of Natural Energy*. He did not meet Viktor, but developed a friendship

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with his son Walter and met many of Viktor's old friends and colleagues. In 1963 he formed the Swedish Science Group for Biotechnical Technology which produced (among other devices) an 'apparatus for biological synthesis of spring water,' which was similar to Viktor's Repulsator.

This important research is being carried on today by the Institute for Ecological Technology (IET) in Malmo, Sweden. IET was formed by Olof Alexandersson as a foundation to continue the work of Biotechnical Technology. In the early 1980s IET organized an expedition to the Ouluanka Nature national park in Finland. Its aim was to verify Viktor's observations in an untouched natural environment. Later, IET replicated Schauburger's 'double water jets' experiment and (see p. 99) continued to work with the Repulsator.

Today IET is run as an association which evaluates, develops and applies Viktor Schauburger's ideas and theories. It operates a loose network, the IET-community, to help anyone who has an idea for a research project in the area, and runs networking seminars. IET helped with the organization of International Workshops for Natural Energies (IWONE 2001) in Leipzig and IWONE 2003 near Malmo, Sweden.

IET (which was known as the 'Malmo group') has replicated Schauburger's Stuttgart experiments, interpreting them in the light of modern chaos and self-organizing systems research. Ongoing projects are mainly in three areas: for the purification, improvement and desalination of water; for energy production using ideas from the turbine in the Repulsine; and propulsion methods for air and water vehicles.

AUSTRIA

After his father died, Walter Schauburger set up, in 1962, the Pythagoras Kepler School (PKS) at Engleithen in the Salzkammergut mountains of Upper Austria (Fig. A.1). Walter was a physicist and mathematician, and set out to validate mathematically his father's research.⁶ His particular interests were harmonic theories (the monochord) and conceptions of non-Euclidean geometry (plane sections of a hyperbolic cone). He never published his research; however, Callum Coats, who studied with Walter at the PKS, is currently writing up some of Walter's work. It was intended that Walter's eldest son, a lawyer, Dr Tilman Schauburger should succeed him at the PKS but, in the event, Tilman died shortly after his father's death in 1994.



Fig. A. 1. The Pythagoras Kepler School at Engleithen.

As a result, Walter's younger son Jorg gave up his work in the Austrian media to help save his grandfather's work. Aided by his wife, he runs courses at the PKS for those who wish to learn more about the Eco-technology heritage. Every year, there are usually about six seminars in German, with participants from Austria, Germany, Switzerland, but also from Italy, Hungary, the Benelux Countries or from Scandinavia. Less frequently they now also run international seminars in English, bringing together people from all over the world who are engaged in Schauberger-inspired research, to share their findings. Speakers at these seminars are specialists or technicians in water or environmental issues who are willing to follow unorthodox ways of studying how Nature works. Members of the PKS now give lectures in many different countries round the world.

Water and the vortex are the present main topics of study at the PKS. However, they intend to test Viktor's ideas for river balancing with energy bodies and flow guides to help rivers flow naturally and to protect valuable land and property from flooding.

The Schauberger Archives are open for research by appointment — see the PKS website. The PKS copper gardening tools, books, cards and videos are on sale by mail order.

GERMANY

Although Viktor's contemporaries have long since gone, and also most of Walter's, there are still some who knew them. Dr Norbert Harthun has re-formed his Gruppe der Neuen (the New Group), whose aims are to explore Viktor and Walter Schauberger's theories and to interpret them in contemporary scientific idiom.

In 1967 the terms 'environmental pollution' and 'environmental protection' were virtually unheard of. At that time nobody demanded a gentle technology, friendly to Nature. In that year Walter Schauberger, a scientist who was then a 'lone voice,' gave a lecture on 'Biologically Oriented Technology,' in the centre of the heavily polluted Ruhr (the main coal mining area of Germany). Inspired by Walter's message, Norbert Harthun, and a few other specialists, persuaded Walter to join the Gruppe der Neuen in Aachen to promote a technology that conformed with Nature's laws. The Group also decided to launch their own scientific bulletin *Mensch und Technik* — *naturgemass* to publish articles about the possibilities of a new science for working with Nature. This innovative journal has now been a leader in its field for 26 years.

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Members of the Group have given many lectures at home and abroad on the theme of how to restore good heart to Nature and the environment as part of a requirement for a high quality of life. The pioneering work of this and similar groups has initiated a change in awareness that was inconceivable thirty years ago. The 'Gruppe der Neuen' has remained consistently independent from institutions and sponsors. It is still active, and its website gives details of its published articles.

Implosion is a quarterly magazine founded in 1958 by Aloys Kokaly, generally aimed at the lay reader, which is still published quarterly or semi-annually by Klaus Rauber. It has been, without doubt, the richest repository of Viktor Schaubberger's writing (in German), and has been the source of substantial portions of the Eco-technology series.

BRITAIN

John Wilkes, an artist and sculptor at Emerson College in Sussex, has pioneered the Virbela Flowforms, which are a series of formed basins, arranged on sloping ground, to stimulate a water flow into figure-of-eight vortical movements, causing the water to pulsate rhythmically (Fig. A.2). This movement simulates a mountain stream, energizing, restructuring and oxygenating the water. His first Flowform installed near Stockholm, Sweden in 1973, which is part of a biological sewage recycling system for a community of 200, has been a great success. The recently established Flow Design Research Institute, through the Virbela International Association, has contacts in 35 countries that have led to more than 1000 installations in over thirty countries, their purposes ranging from the aesthetic and educational to biological purification, farming, interior air conditioning and medical/therapeutic use. For further information, see Wilkes' Flowforms: the Rhythmic Power of Water.

Wilkes studied projective geometry under the distinguished mathematician George Adams, joining him at the Institut fur Strömungswissenschaften (Flow Research Institute) at Herrischried in Germany, where he later collaborated with Theodor Schwenk (see Sensitive Chaos). It is tempting to believe that Schaubberger's insights about water probably share a common source with those of Adams. Certainly people often tend to link Wilkes' Flowforms with Schaubberger's vision of water.

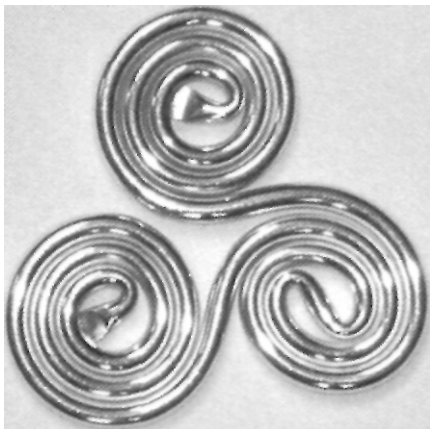


Fig. A.2. Flowform.



Fig. A.3. Vortex energizer.

Fig. A.4. Triple harmonizer.



Implementations, a British group which markets the Schauberger-inspired copper gardening tools is also developing a full-sized phosphor bronze 'Golden Plough' in order to run tests to replicate the increases in fertility that Viktor found with his prototype.

A novel initiative combining healing techniques with the Schauberger vortex principle has been developed by the Centre for Implosion Research (CIR), in Plymouth. Specially imploded water is injected into a spiral-vortex cone-shaped copper pipe. The specific shape enables continual recharging of the imploded water from cosmic energy (the ether) always present in the environment, and is used to improve the quality of either standing water or drinking water supplies and to balance the energy in local environments (Fig. A.3).

The CIR also produces much smaller, 'personal harmonizers,' flat spiral shaped tubular forms inspired from the spiral carvings found at the great Neolithic ritual site at New Grange in Ireland (Fig. A.4). The small tubes contain imploded water, which is continually recharged by the environment because of their spiral form. Worn as ornaments or jewellery, they enhance the personal energy field and may be placed under a glass of water or a wineglass to improve the quality of the liquid. The great popularity of these devices is a compliment to their efficacy to improve energy or enhance individuals' sense of protection and of wellbeing (see www.sulis-health.co.uk).

DENMARK

One of a number of vortex water treatment groups, Clean-Water has developed a very practical two-litre jug for home use. The Living Water Vortex Jug (Fig. A.5) employs in its screw-down lid a small motor to drive a silver impeller that forms a splendid vortex in the water for 3 1/2 minutes. It claims to erase impressions of the water's history of abuse, by superimposing more refined, constructive energies (see p. 156). The water is restructured, cooled, softened and purified, and has been very well received worldwide.

USA

The pioneer spirit is still alive in the USA, and we expect to add many to our list of American Schauberger innovators. The interest in permaculture and biodynamic farming predisposes many towards Schauberger's vision.

One such is Dan Reese, who developed Vortex Water Systems in Texas, inspired by reading Alexandersson's *Living Water*. They are

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designed to solve the increasing problem of pollution of wells in the American South, by unwanted salts and minerals, and to restructure the water so that it feels smooth, uses less soap and tastes pure. The Vortex system (Fig. A.6) has no moving parts or filters, does not use chemicals and is driven only by the force of the well pump.

It was found that the system could be expanded to service as many as 76 homes from one well. A system is now being tested for removing mineral salts from a salt intrusion well and a larger farm system to help with the problem of cotton rot and to use less water to grow the same amount of crops. These will be major breakthroughs for the industry.

AUSTRALIA

As in the USA, many Australians are sympathetic to Schauburger's ideas. Many people depend on rivers for their water source. The author, Callum Coats, who has tested a number of Viktor's experiments, was inspired to design a well to receive water filtered from the river. A well should be dug about 5-10 metres from the river bank, depending on the size of the river, about 1.5 metres in diameter, the depth to correspond to the depth of the river bed. If the soil between the river and the well shaft is porous, the water will be filtered by the soil. If the soil is impervious, a channel connecting the river and well shaft should be dug and filled with fine sand to act



Fig. A.5. Living water vortex jug.

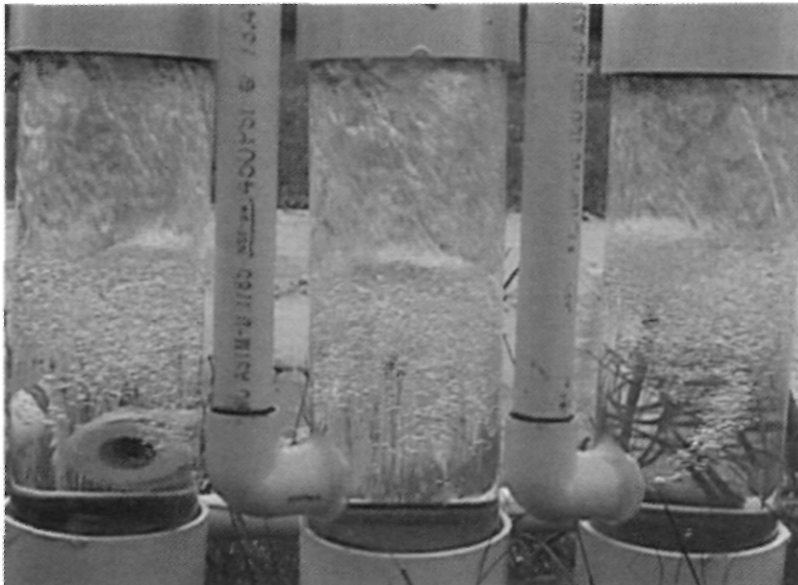


Fig. A.6. Vortex water system.

as a filter. The well shaft must be entirely covered at the surface, to keep the well dark and cool and discourage the growth of pathogenic bacteria. The pump should be well away from the opening to avoid pollution, and the opening should be raised if there is any chance of the river flooding and pouring into the well (see Living Energies, p. 202.) This system was first set up in 1972 and in recent contact with the present owner of the property (purchased in 1979) Callum Coats was told that the water supply had at all times functioned flawlessly, and still does.

Callum Coats is also involved in the making of a three-part video on Viktor Schauberger's theories in conjunction with Martin Selecki of 'Filmstream' in Byron Bay, NSW, as well as in the production of a 50 litre water cooling egg-shaped container in association with Phil Sedgman of 'Living Water Flow-Forms,' also of Byron Bay.

Endnotes

Introduction

1. Living Energies, p. 28.
2. 'The Emergence of Biotechnology,' by A.Khammas, Implosion magazine no.83, p. 19.
3. The Schauburger Archives, Linz, Jan, 1952.
4. The scientific environment has considerably narrowed. Scientific research in the 1930s was largely government funded, and research for the most part was independent of commercial interest. Schauburger would be appalled by the present environment which, still identified with the material viewpoint, is now almost entirely dependent on industrial funding and the consequent demand that scientific research serves the needs of business and commerce. In addition, the anonymous 'peer review' system is a form of censorship against those who propose research that does not conform to convention, or which threatens the reviewer's own agenda.
5. Living Energies, p. 9. His arch enemies, the Viennese Association of Engineers, had hatched a plot to dispose of him in a mental hospital, under SS observation. Schauburger was to go into the Vienna University clinic for a routine examination of his WWI wounds. Before this, by coincidence, he had tea with an old friend, Mrs Primavesi and told her he would return in twenty minutes. When he did not, and she found he had not returned home either, she went to the nearby clinic, whose director she knew well, refusing to leave until Viktor had been found. He turned up in the portion of the hospital reserved for the mentally insane, trussed up in a straightjacket waiting for the lethal injection (the standard practice for the disposal of undesirables in that regime). Needless to say, she quickly extricated him. (Another theory is that the plot against him was ordered by Hitler himself, who had met Schauburger.)
6. See also Chapter 18, p. 252, for Richard St Barbe Baker's account.
7. Viktor Schauburger, Our Senseless Toil.

1. Schauburger's Vision

1. The Schauburger Archives.
2. Published in Die Wasserwirtschaft, 20,1930.
3. Ancient Futures: Learning from Ladakh, by Helen Norberg-Hodge.

2. Different Kinds of Energy

1. A few years ago, it was established by precise calculation that the bumblebee's body weight prohibits it from flying, according to the laws of aerodynamics. (Just as well the humble bee wasn't told.) Clearly there is much that conventional science does not understand about Nature!
2. Teilhard de Chardin, priest-scientist, was the first to propose this, in answer to his ongoing question: 'How can the two realms of our experience, the outer and inner worlds, be reconciled?' David Bohm went further, insisting that matter and energy are one and the same. He described two orders, the Explicate Order being what we can measure and to some extent describe; and the Implicate Order which we cannot measure, and in our present state of knowledge and evolution, cannot adequately describe.
3. The implication of this natural law is that compassion will triumph over selfishness, generosity over greed, a law more evident higher up the evolutionary ladder. This outcome may at present look distant, but if we believe that it is meant to be, then our small attempts to make changes should gain the cooperation of all-powerful Nature. This is similar to the Christian belief that God will cooperate if only we take the first steps. Also, see 'Opposites working towards Balance' (p. 52).
4. The qualities of higher dimensions are: Fourth — Time (control of space/time); Fifth — Presence (outside of space/ time); Sixth — Potential (the creative state which is non-dimensional); Seventh — Gateway to the Divine.
5. These diagrams are from From Atoms to Angels by Paul Walsh-Roberts, a very accessible introduction to these concepts.
6. Another important by-product of quantum physics research is the work of US physicist Hugh Everett, who in 1957 observed that when a measurement is performed on a quantum system, all possible outcomes of the measurement actually occur; this contrasts with the conventional view that only one of many possible states is ever observed. His proposal leads to the conclusion that the Universe is constantly dividing to give vast numbers of alternative universes that co-exist, but do not interact with each other, and that we live in a single one of these many universes.
7. For a good introduction to the dimensional shift and how it will affect us all, see Cori, The Cosmos of Soul (details in Bibliography).
8. See further particularly in Chapter 3. Calum Coats calls this resolution of apparently conflicting elements 'dialectic thinking,' by which unity is found (Living Energies, pp. 61-64, esp. table p. 63), and quotes Hegel defining this as, 'the process of thought by which such contradictions are seen to merge themselves in a higher truth that comprehends them.'
9. Living Energies, p. 74.

3. The Attraction and Repulsion of Opposites

1. The ozone layer filters out the harmful ultra-violet rays known as UVa and UVb. The UVc, which have a different wavelength, are allowed through, and play a large part in the growth of organisms (for instance, helping to build healthy bones).
2. Viktor Schauburger once commented wryly that instead of asking himself what caused the apple to fall to the ground, Sir Isaac Newton should have asked how it got up there in the first place!

4. Natures Patterns and Shapes

1. Your Body Doesn't Lie (Behavioral Kinesiology) by John Diamond MD, Harper and Row, New York, 1979.
2. This is the basis of the 'muscle test' to discover foods that may be toxic for someone. The subject holds the sample (maybe a bottle of wine) in the left hand, or to

their chest, while the 'tester' tries to push down the raised right arm of the subject, who tries to resist the pressure. If the arm has lost muscle tone, the food may have an undesirable effect on the subject.

3. Living Energies, p. 42.
4. If they are above absolute zero (-273°C).
5. BBC Wildlife magazine, June 2001.
6. See Bibliography: Backster; also Bird & Tompkins The Secret Life of Plants contains an evaluation of his work.
7. Cymatics: The Study of the Interrelationship of Wave-forms with Matter, by Hans Jenny, Basilus Press, Basle, 1966.
8. Democritus (460-370 BC)
9. Callum Coats shows scores of examples from Nature in Living Energies, pp. 51—53.
10. Harold S. Burr, Blueprint for Immortality: Electrical Patterns of life Discovered, Spearman, 1972.
11. Lawrence Edwards: The Vortex of Life: Natures Patterns in Time and Space, Floris Books, 1993.
12. Earth's diameter is 7,920 miles; the Moon's is 2,160.
13. Named after a twelfth century Italian mathematician born in Pisa, Leonardo Fibonacci or Filio Bonaccio. The son of an Italian customs agent based in Alexandria, he helped to bring Arabic numbers to the Roman world and popularized the modern decimal system of numbers. The series bearing his name progresses by adding the two previous numbers to make the next, e.g. 1,1,2,3, 5,8,13,21,34,55,89, etc. (It is said that he used it as a model for the growth of a population of rabbits.) Dividing a Fibonacci number by the number before it produces the Golden Mean proportion (the Golden Ratio) in increasing accuracy of decimal places, the larger the number.
14. Walter Schauburger's research of this phenomenon was groundbreaking.

5. Energy Production

1. There is controversy about whether human activities are the cause of global warming. Climate change goes through enormous cycles. In Britain, for example, from 1,000 years ago when it was much warmer than now (grapes were grown in Scotland), to 200-300 years ago when the ice on the Thames could support an elephant, with many fluctuations in be-

tween. We have insufficient records to say with certainty that the present accelerated warming world-wide is cyclical in its origin. However, there is little doubt that its increasingly severe impact is greatly compounded by the enormous output of carbon emissions (Observer, January 5, 2003). See also Chap. 13, note 1.

2. The average fuel consumption of a typical car allows a journey of 620 miles (1000km) for an energy expenditure of 1000kW, or one person's annual energy consumption. In terms of oxygen consumed, a car driven at 50kph requires 22.25kg of oxygen, roughly 750 times the amount needed by a human being for the same period. In eleven hours, the car has consumed the oxygen one human being requires for a year. Callum Coats calculated that to replenish the oxygen devoured by the world's roughly 450 million vehicles would require a healthy productive forest of 38 million km^2 , or 28% of the total world's total land area.
3. Kilowatt hours.
4. The ratio between created matter and the energies required to create it was established in 1984 by the Nobel awarded Swiss atomic scientist Dr Carlos Riebers as about 1:1 thousand million, effectively the proportion of the whole of reality of which we are aware.
5. Entropy has its counterpart — ectropy (sometimes called 'negentropy'). The laws of entropy or thermodynamics apply to the products of our mechanistic science as it is a 'closed' system. Nature, however, is an open system, and one finds in fact that entropic tendencies are held in check by the predominant ectropic ones, otherwise life could never have developed. Evolution is essentially ectropic or energy integrative rather than energy dissipative, as increasingly complex organizations harmonically stabilize more energy.
6. Weston Price: Nutrition and Physical Degeneration, 1938,1945,1998. As an experienced dentist, he noted the degeneration of jaw and bone structure, but also the deterioration in intelligence that ensued from a change to western diet.
7. Living Energies, p. 35.
8. See Living Energies, pp. 50-55 for further illustrations of spiral forms in Nature.
9. H.H.Price, Wyckham professor of Logic at Oxford (Hibbert Jour, 1949).

6. Motion — the Key to Balance

1. Viktor Schauburger, Implosion magazine no.51,p.22.
2. Viktor Schauburger, Implosion magazine no.48,1954.
3. A hyperbolic spiral represents the physically nonmaterial centre-less dynamic of Nature's outside>inward motion. The phi spiral is the dynamic of inside>outward physical and material growth.
4. Ibid. p. 56.
5. Dr Tilman Schauburger, Viktor's grandson and an expert on his work, described his grandfather's ideal spiral-vortical motion, the 'Cycloid Spiral Space-curve,' as goal-oriented, structured, concentrated, intensifying, condensing, dynamic, self-organizing, self-divesting of the less valuable, rhythmical (cyclical), sinuous, pulsing, in-rolling, centripetal (and out-rolling centrifugal) movement. This applies also to Figs. 12.1 and 12.2.
6. If the starting radius is 1 and the initial resistance is 1 on an inwinding path, when the radius is halved, the resistance is $[V2]^2 = 1A$ and the rotational periodicity, frequency or velocity is doubled.

7. The Atmosphere and Electricity

1. High specific heat means that water is slow to heat up, but also slow to cool. Its heat retaining quality makes it good for heat storage systems.
2. The temperature neither decreases nor increases constantly, but fluctuates as we ascend through the various atmospheric layers, so that at a certain altitude, at around 7 miles (12km) for instance, the temperature is -76°F (-60°C), whereas around 31 miles (50km) it is 50°F ($+10^{\circ}\text{C}$).
3. This increases by the inverse square of the separation. If, for example, the separation is 10mm, then the potential is 12. If the separation is reduced to 1/2, i.e. 5mm, then the potential is 22 (=4) and so on, as shown in Fig. 12.6. The smaller the separation, therefore, the greater the corresponding potential, which could be unleashed once the permittivity of the dielectric has been overcome. (Permittivity is the amount a substance can assist or resist the transfer of an electric charge.)
4. Pure water has a dielectric value of 81, which is 81 times greater than a vacuum

- (=1). A thin layer of pure water vapour may therefore have the capacity to resist the transfer of enormous charges, permitting the accumulation of very large voltages and potential. The concentric layers of water vapour with a temperature of 4°C may thus act like a spherical condenser, formed of nesting spheres which charge the Earth with energy.
5. Being in a lower dynamic and more harmonically stabilized energetic state, the greater density of water vapour at increasingly lower altitudes may well correspond through resonance to the lower wavelengths of the incident radiation, whose frequency has been reduced by contact with the braking effect of the atmosphere, thus creating the medium with which radio-waves are reflected back to Earth.
 6. For elaboration of how this can be demonstrated, the reader may read Coats' description of Lord Kelvins and Walter Schauburger's experiments (Living Energies, pp. 95-99).
 7. Leopold Brandstatter, Implosion statt Explosion, self-publication, Linz 10, Fach 20, Austria.
 8. Living Energies, p. 100.
 9. Kenneth David and John Day: Water — The Mirror of Science, p. 149, Heinemann Educational, 1964.
 10. A 1°C rise in temperature causes the retention, but not necessarily an even distribution, of an additional 1,000 million cubic metres of water vapour in the atmosphere (Living Energies, p. 100).

8. The Nature of Water

1. Our Senseless Toil, Pt.I, p. 11.
2. See The Divining Hand by Christopher Bird.
3. Davis, K.A. and Day, J.A., Water — The Mirror of Science, 1964.
4. Implosion magazine, no.8., 1945.
5. How to obtain safe drinking water is dealt with in Chapter 12.
6. Viktor first came to the attention of hydrologists in 1922 with his revolutionary water-flume design for transporting logs inexpensively from inaccessible untouched mountain forests without the usual high rate of damage of conventional methods. This, his first encounter with opposition from the scientific establishment, is well described in both

Living Water and in Living Energies.

7. The extra 'e' enlarges the meaning of the usual carbon, to include a whole range of elements used in forming the physical structures of life (see further on p. 51).
8. Viktor Schauburger, Our Senseless Toil, Pt.I, p. 4.

9. The Hydrological Cycle

1. The Memory of Water — Homeopathy and the Battle of Ideas in the New Science by Michel Schiff, Thorsons, 1995. Callum Coats has more on Benveniste's research and the controversy around it, in Living Energies, pp. 119-121.
2. The temperatures indicated on the following diagrams do not necessarily conform to actual temperatures, but are intended to demonstrate the process.

10. The Formation of Springs

1. The French for spring is source.
2. Callum Coats adopted an impeller design taken from Schauburger's 1936 patent for an air turbine.

11. Rivers and How they Flow

1. From Viktor Schauburger's treatise, 'Temperature and the Movement of Water' ('Temperatur und Wasserbewegung'): Die Wasserwirtschaft, No.20, 1930.
2. Schauburger also pioneered new designs and built fourteen such dams. For information on this, see Living Energies pp. 159,160, and The Water Wizard, pp. 101, 121,122-34,209.
3. See also The Water Wizard, p. 207.
4. Schauburger established that turbulence was a natural automatic acceleration-restricting brake in flowing water, in a treatise he published entitled 'Turbulence.'
5. Callum Coats in Living Energies, pp. 176-7 describes one he saw.

12. Supplying Water

1. The Ecologist, May 30,1999.
2. International Water Management Institute.
3. Guardian Weekly, March 14,2001. The UN Department of Economic and Social Affairs estimated that six countries will account for half the increase: India,

Bangladesh, Pakistan, China, Indonesia and Nigeria. Their startling projection is based on the assumption that fertility will continue to decline. The population explosion would be even more dramatic but for the HIV/AIDS epidemic. The report noted that increased international migration would be one consequence. The pressure on food resources will be enormous, but the impact on water supplies for the developing countries will be nothing less than catastrophic.

4. National Geographic magazine, 'Earth's Fresh Water under Pressure', Sep. 2002
5. The Ecologist, May 30,1999.
6. National Geographic magazine, ibid.
7. The Ecologist, May 30,1999.
8. Ibid., Caspar Henderson.
9. Ibid.
10. Viktor Schauburger, Our Senseless Toil.
11. Fluoride — Drinking Ourselves to Death? by Barry Groves is a well-informed source of factual information on this subject. (Gill and Macmillan, 2001)
12. Ibid.
13. Waldbloot, McKinney and Burgstahler: Fluoridation: The Great Dilemma, Coronado Press, 1978:288.
14. Jour. Dent. Res. 1990; 69:723-7.
15. 'Living in a democratic fluoridated country,' Australian Fluoridation News, Sep-Oct 1995;31(5).
16. Barry Groves, Fluoride: Drinking ourselves to Death?, p. 227. Gill and Macmillan, 2001.
17. Viktor Schauburger, Nature as Teacher, p.5.
18. The best ones have a four-stage system: ceramic for bacteria, carbon for chemicals and organic contaminants, ion exchange for heavy metals, and block carbon for final cleansing; the filters being easy to change, every six months.
19. We discussed higher energies interpenetrating our physical world in Chapter 2.
20. Our Senseless Toil, Pt. II, p. 14.
21. The energies are essentially dynagens, or growth-promoting, created by the bio-metal composition — silver (male), and copper (female); the silver also has bactericidal properties. Dynagens are also produced by the centripetal movement of the main water body flowing down the centre, raising the overall vitality, life-energy and wholesomeness of the water.
22. Callum Coats describes these experiments in detail in Living Energies.

23. Our Senseless Toil, Pt. II, p. 34.
24. Heart specialists were recently astonished to discover that blood flow through the heart and arteries depended on a spiral movement (New Scientist, Feb. 6, 2001).
25. 'Hydrodynamics of Blood Flow,' by Dr. Ernst O. Attinger, Div. Biomedical Engineering, University of Virginia Medical Centre, Charlottesville, VA 22901, USA.

13. The Role of the Forest

1. From the Schauburger Archives.
2. 'The Dying Forest' ('Der sterbende Wald'), by Viktor Schauburger, Pt. 1: Tau magazine. Vol. 151, Nov. 1936, p. 30.
3. The Gulf Stream, which gives north-west Europe an exceptionally mild climate, might fail for two reasons: (a) the inability of the failing Amazonian heat engine to push the stream from the Caribbean; (b) the cold, salty waters around Greenland power two 'pumps' which draw the warm Gulf Stream towards Northwest Europe, and send cold water back southwards. The heavy cold water streaming down the coasts of Greenland pours into the abysses, propelling forward the lighter and warmer Gulf Stream. Fresh water from the melting Greenland icecap could weaken the pumps and close down the Gulf Stream. An important new theory is that, within a few years of the failure of the Gulf Stream pumps off Greenland, a new mini ice age would quickly spread in the North Atlantic, with temperatures dropping by 10°F in north-eastern USA and in Western Europe (Woods Hole Oceanographic Institute Report, Nexus, Feb. 2003 and especially see www.whoi.edu). Interestingly, over seventy years ago, Viktor Schauburger predicted that over-clearing of forest and critical mismanagement of water supplies would lead to a new ice age (in Our Senseless Toil).
4. Soil under forest floors retains ten times more water than nearby grassland. The Amazonian basin was almost devoid of humid tropical rainforest in the last glaciations. Clearing the forest produces high contrast between day and night temperatures, gusty winds and dry soil. Clear-cutting and burning cause dieback in neighbouring forest; water table disappears and desertification ensues.
5. 1.5 to 2 million animal species live in the forest canopy. A profusion of epiphytes

(ferns, orchids, and so on) takes up nutrients flushed down by heavy rain. All nutrients are retained within the entire system, and provide for the lateral expansion of the forest. Medicinal plants are common, many of which are as yet unresearched and may be lost forever. The tropical rainforest environment exhibits the highest levels of evolutionary development and biodiversity.

6. 'Destroy the Amazon — Destroy the World' by Peter Bunyard, The Ecologist, Jul/Aug 2002

7. The Amazonian Forest produces latent heat to drive air masses in three separate directions:

1. Crossing the Caribbean to Florida, helps drive the Gulf Stream NE
2. Over the Andes into the Pacific west-erly, following the trade winds
3. Southwards, towards Patagonia

In the temperate latitudes, rainfall is derived from moisture-laden winds blowing in from the oceans. The tropical rain-forests, on the other hand, particularly the Amazonian, actually create rainfall and recycle it. Only 25% of the Sun's energy heats the air. The remaining 75% is converted into 'latent heat' by evapo-transpiration, the mechanism through which water is pumped into the atmosphere from the leaves and stems of the plants. The humid air rises rapidly, forming cumulo-nimbus and layered clouds that irrigate areas further downwind, releasing the latent heat energy back into the atmosphere. Two-thirds of the world's rain-fall is affected by these cloud systems that also produce most of the world's lightning in a narrow band on either side of the Equator, helping to power the out-reach of surplus energy from Amazonia to neighbouring countries.

8. Except when the El Nino is operating a contrary wind system.

9. Permaculture Institute, P.O.Box 1, Pyal-gum 2480, NSW, Australia. Permaculture International Ltd, P.O.Box 6039, South Lismore 2480, Australia.

14. The Life and Nature of Trees

- I. Viktor Schauburger insisted that we must understand more about the vital impor-tance of trees for our environment. This chapter, except for the last section, is rela-tively standard information about trees which, as the highest form of the veg-

etable kingdom, have a mediating role with the animal kingdom.

2. From Design in Nature by J. Bell Petti-grew, Longman Green, 1908, p. 671

3. Adapted from Health and Light by Dr. John N.Ott: Devin-Adair, Greenwich CT, USA, 1973.

4. There is an intriguing exception to this rule. Balsa, the softest wood of all, grows in certain equatorial forests. This sug-gests that the wood-quality-determining frequency has proceeded past the point where hardwoods are created and has re-entered the resonant conditions of the softwood-generating frequencies, al-though one full octave below, because balsawood is a magnitude softer than the softest of normal softwoods.

5. Schauburger found that the quality of resonant timber could be improved by submersion in a highly energetic moun-tain stream. In fact, the timber for the fa-mous Stradivarius violins that had su-perb resonance was from mulberry that had fallen into Alpine streams.

6. See Wertheimer, N., 'Electrical Wiring Configurations and Childhood Cancer': American Journal of Epistemology (Mar. 1979). Also: Perry, S. and Pearly, L., 'Power Frequency Magnetic Fields and Illness in Multi-Storey Blocks,' Public Health (1988) p. 102. See also: Dowdson, D et al., 'Overhead High Voltage Cables and Recurrent Headaches and Depres-sion: Practitioner, 1988, pp. 435-6.

7. Cowan, D. and Girdlestone, R. in Safe as Houses? describe the German researcher Volkrodt's theory of the resonance similar-ity of some trees' leaves and needles to mi-crowave receivers.

8. Ibid.

9. Girdlestone regards brief exposure to a microwave oven in good condition not to be dangerous. The problem, he says, is that acceptable emissions vary internationally; he quotes one German test in which nearly all the 101 ovens emitted more than the makers' guarantee, but passed the Ger-man requirements, while all would have failed the Russian standard.

10. Callum Coats gives a fuller description of photosynthesis in Living Energies, pp. 218-220, from which our table is repro-duced.

11. See Bunyard, The Breakdown of Climate, p. 77.

15. The Metabolism of the Tree

1. Viktor Schaubberger, *Our Senseless Toil*, Pt.II,p.34.
2. For greater detail on this experiment, see Viktor's description in *The Water Wizard*, pp. 50-52, or Callum Coats in *Living Energies*, pp. 131-32. Callum also describes another experiment designed by William Morgan in the 1860s that shows the action of true springs.
3. Diagrams from *Wurzelatlas; mitteleuropaischer Grunlandpflanzen*, Vol. 1, 'Monocotyledoneae' 1982, and Vol.2, 'Pteridophyta und Dicotyledoneae,' 1992, by L.Kutschera and E.Lichtenegger: G.Fischer, Stuttgart, Germany.

16. Soil Fertility and Cultivation

1. *Tau* magazine, Vol. 146, p. 11,1936.
2. *Our Senseless Toil*, Pt.I, p. 13.
3. From the Schaubberger Archives.
4. *Genetic Engineering*, by Mae-Wan Ho, Gateway 1998, Gill and Macmillan, 2000.

17. Organic Cultivation

1. *The Survival of Civilization*, self-published by John Hamaker and Don Weaver.
2. Further detailed information on rock dust can be obtained from any of the following: Don Weaver, P.O.Box 1961, Burlingame, CA 94010, USA; Joanna Campe, ed. of *Remineralize the Earth*, 152 South St., Northampton, MD 01060, USA; Barry Oldfield, president, 'Men of the Trees,' 3 Over Avenue, Lesmurdie 6076, W Australia; *Das Buch von Steinmehl* by Helmut Snoek: Orac-Pietsch, Germany.
3. Alex Podolinsky's work is fully elaborated in *The Secrets of the Soil*, by Christopher Bird: Harper, New York
4. Austrian Patent No.265991.
5. *Implosion*, No.45, p. 3.
6. Excerpt from a letter from Viktor Schaubberger to Dagmar Sarkar in the mid-1950s; the diagram has been redrawn and annotated by Callum Coats for greater clarity.
7. An alternative egg-shaped amniotic liquid manure transformer is described on p. 273 of *Living Energies*.
8. Viktor Schaubberger, *Implosion* magazine.
9. Viktor Schaubberger uses the prefix ur- to

indicate what he called the 'first born or basically primeval.

10. Schaubberger Archives, Linz, January 1952.
11. Viktor Schaubberger, *Our Senseless Toil*.
12. Excerpt from a letter from Viktor Schaubberger to Dagmar Sarkar in the mid-1950s; the diagram has been redrawn and annotated by Callum Coats for greater clarity.
13. *Implosion* magazine, No.37, p. 8.

18. Harnessing Implosion Power

1. *The Hunt for Zero Point*, by Nick Cook, Century 2001. Nick Cook is a veteran aerospace researcher; he is Aviation Editor and Aerospace Consultant to *Jane's Defence Weekly*, the world's leading military affairs journal, and *Industry/Defence* Editor of *Interavia*, the aerospace trade publication.
2. *Ibid*.
3. For background, refer to 'After 50 years the Cover-up Conspiracy goes on' by Hamish Mackenzie (*Sunday Express*, June 16, 2002), on Dr Stephen Greer's 'Disclosure Project' to persuade Congress to set up an open hearing on the secrecy surrounding the US government's UFO and alien contact and research programmes. The big US corporations like Boeing, Lockheed Martin, Northrop Grumman would benefit most from alien technology.
4. *The Hunt for Zero Point*, Nick Cook.
5. Viktor Schaubberger, *Implosion* magazine, no.71,p.12.
6. Viktor Schaubberger, *Implosion* magazine, no.83,p.17.
7. *Living Energies*, p. 276. The Schaubberger quote is from *Mensch und Technik*, year 24, vol.2,1993.
8. Callum Coats cites Russian research published in 1992, which describes space as multi-layered (layers, if you like, belonging to different dimensions); and a vacuum, not a 'curved void' as usually understood, but to be composed of elementary vacuum particles resulting from the conversion of actual electrons and protons into virtual states which exist, not in our space, but in a complementary layer. (*Living Energies*, p.276)
9. Letter to Aloys Kokaly in 1953 — *Implosion* magazine, no.29, p. 22.
10. From St Barbe Baker's Foreword to *The Schaubberger Departure*, (September 28, 1980) which was the original title for what

subsequently became *Living Energies*.

11. Callum Coats commented that the water she poured in was probably charged with silicates, which Viktor considered essential to healthy water. The natural oscillating concentrative vortical flow in healthy streams also produced Viktor's 'emulsions' from the fine dispersions of minerals and trace elements (including silicates) which endow the upstream-moving water with the levitational energies that enable trout or salmon to negotiate high waterfalls.
12. A. Khammas in *Implosion* magazine.
13. *Living Energies*, p. 287.
14. These phenomena are discussed in greater detail in *Living Energies*, pp. 275-93, and particularly in *Energy Evolution*.
15. Viktor Schaubberger, *Implosion* magazine, No.36,p.3.

19. Viktor Schaubberger and Society

1. Increasingly, one is drawn to Gurdjieff's dictum, that humanity is asleep, or to change the metaphor, the blind are leading the blind.
2. *Our Senseless Toil*.
3. Unpublished ms. The authors are NLP trainers. Peter Wrycza's book *Living Awareness — Awakening to the roots of Learning and Perception* was published by Gateway in 1997. A few pioneers in education have attempted to redress this overemphasis on absorbing discrete facts that have no connection to the student, by adopting a more holistic, inclusive, approach. The most successful of these have probably been Maria Montessori (Montessori schools for the younger ages) and Rudolf Steiner (the Waldorf Schools) for the whole age range.
4. 'Fast Forward into Trouble' by Cathy Scott-Clark and Adrian Levy (*Guardian* Weekend, June 14,2003) on how murder, fraud, and drug offences are plaguing the peaceful Buddhist idyll of Bhutan, only four years after the introduction of 46 cable TV channels.
5. Interview by Ursula Kenny in *The Observer*, September 1,2002, in connection with the publication of Dr Rowe's book *Beyond Fear*, Harper Collins, 2002.
6. A short biography of Walter Schaubberger can be found on the PKS website.

Resources

Schauberger- & Ecotechnology-associated Websites & addresses

(For more up to date information, please look on our website: www.Schauberger-books.org.uk)

The Schauburger Institute & Research Centre, known as the PKS (Pythagoras Kepler School), of which Jorg Schauburger, Viktor's grandson, is the director:

PKS, Kaltenbach 162,4821, Lauffen, Bad Ischl, Austria; www.pks.or.at

Norbert Harthun, one of Walter Schauburger's colleagues still runs the group that is probably closest to Viktor Schauburger's work. Groupe der Neuen: www.gruppederneuen.de

Callum Coats, the principal authority in the English language, on Viktor Schauburger's research. He spent several years studying with Walter Schauburger and then, over a period of nearly twenty years, set about translating and editing most of the archive of Viktor's writing. He is the author of Living Energies and the editor of the four-volume Eco-technology series: www.Schauberger-Ecotechnology.com

The U.K. networking centre, run by Alick Bartholomew. Its purpose is to keep an up-to-date list of various research projects around the world, and to make available Schauburger books, CDs, videos & tapes:
Sulis Health, The Hollies, Wellow, Bath, UK, BA2 8QJ; www.Schauberger-books.org.uk

The Living Water Vortex Jug, and its little cousin the portable Aqua-Vortex (derivatives of Schauburger technology) oxygenate and restructure the water, improving its energy and taste. These, a plumbed-in filter that removes fluorides and most pollutants, and the Personal Harmonizers may be obtained through: www.sulis-health.co.uk

Institute of Ecological Technology (the Swedish Malmo group) are the inheritors of Olof Alexandersson's research: www.iet-community.org

The Schauburger Copper Gardening Tools are produced by Johannes Stadler at:
PKS, 162 Kaltenbach, A-4821, Lauffen, Austria;
e-mail: stadler.cuprum@Eunet.at
— U.K. agent: Implementations, PO Box 2568, Nuneaton, CV10 9YR, UK
www.implementations.co.uk
— US agent: Eco-Restorative Institute, 708 Gravenstein Hwy North #139, Sebastopol, CA 95472
e-mail: info@eco-restore.com

Water Vortex Systems, PO Box 1295, Bandera, Texas 78003, USA
www.texashillcountrymall.com/vortex

Clean Water, in Denmark, is the manufacturer of the Living Water Vortex jugs. Their website is in Danish, Dutch, English & German: www.Clean-ater.dk

Dr Masaru Emoto's books — The Message from Water (see Bibliography) — may be obtained in the UK from Sulis Health, The Hollies. Wellow, Bath, BA2 8QJ (01225 833 150) www.sulis-health.co.uk; In the USA at: info@holisticnetworker.com. Dr Emoto's website www.hado.net contains background to the research, some photographs and networking information.

The Vortex and Implosion — professional & informative sites: www.altenergy.org and www.homepage.ntlworld.com

Vortex World, www.home3.swipnet.se/~w-58759

William Baumgartner's site; implosion-on-line newsletter: www.vortexscience.com

Martin Chaplin of South Bank Univ. on water structure: www.sbu.ac.uk/water

Dr Patrick Flanagan's microclusters in water: www.flantech.com

Dr Jacques Beneviste's research on memory in water: www.digibio.com

David Dennard has put on his website chapters of his book The Pearl of Wisdom which deals with the power of the Vortex, which are worth reading: www.whirlpower.cc

Orgone Labs for books & videos: www.orgonelab.org/livingwater

Holis, a useful German website: www.holis.de/nat/forelle

Filmstream — Water videos: www.filmstream.com.au

Geoff Egel's Encyclopedia of Free Energy, a.k.a. 'Solaris' and 'Research Triangle:' www.geoffegel.tripod.com/turbine

Frank Germano has an informative Schauburger site. He networks regularly with engineers worldwide, attempting to reconstruct Viktor's implosion devices. Main interests: the repulsive, the home power generator, the biotechnical submarine (adapted to air travel for an airship), the water energizers and whorl-pipes: www.frank.germano.com/viktorschauberger.

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- , *The Bellamy Herbal*, Century 2003.
- , *Bellamy's New World: Botanical History of America*. BBC 1983; Smithmark 1985.
- , *The Changing World: The Forest*. Simon and Schuster Educ. 1991, Lincoln, 1999.
- , *The River*. Simon and Schuster Educ. 1991, Lincoln, 1999.
- , *The Rock Pool*. Random, 1988; Simon and Schuster Educ. 1991.
- , *The Road Side*. Random, 1988.
- , *How Green are You?* Random 1991; Lincoln, 1991.
- , *Jolly Green Giant*. Century, 2002; Arrow 2003.
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- , *Secrets of the Soil*. Harper, 1989. (Two classics in the area of alternative science.)
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